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DECEMBER 28, 1957
VOL. 153 — NO. 26

# Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

## FUTURE LINEMEN?

Telephone linemen on poles have always held the interest of youngsters. And probably this early interest has led many of them to careers in the communication business. This lineman seems to be answering some questions of these two "young fry" members.

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ELECTRONICS SECTION — Page 25

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

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RALPH AMERY

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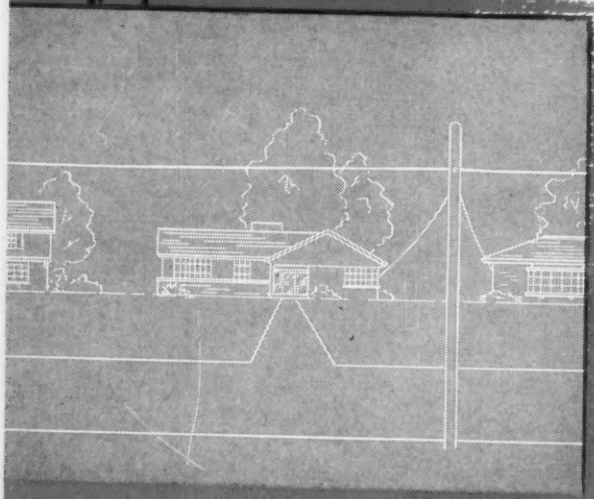

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# FLASHES AND PLUGS

**YULETIDE CONSIDERATION.** Down in Wichita Falls, Tex., a gunman robbed Leo Wood of $200 in the liquor store where he works, tied him up and then telephoned Wood's wife to tell her what happened.

•

**THESE MODERN IMPROVEMENTS.** An Indian with a fire extinguisher strapped to his back was sending up smoke signals. "What's the idea of the fire extinguisher?" asked a curious tourist.

Replied the redskin, "To erasum word if me misspell."

•

**SERVICE DISTINGUISHED.** During her recent visit to the United States, Queen Elizabeth became quite familiar with ribbons and insignia worn by people she met—most of them being military and governmental awards.

Then she came upon a man who wore, among other things, a small insignia in his lapel. Puzzled about it, the Queen asked what it was with great interest.

"Oh, Your Majesty," said the man, "that's for 50 years with the telephone company.

•

**THE GOODS.** A Polish newspaper in Warsaw has called for more automobiles and telephones and better dresses instead of "daydreams" about atomic power, it was reported on Nov. 29.

Plans for building a Polish atom-powered oil tanker were reported the day before by the Polish news agency PAP.

A writer in the government newspaper, *Zlcie Warszawy*, said: "All fairy tales deal with the past and not with the future—but the plans reported yesterday referred to the construction of an atom tanker in 1970."

Perhaps, the commentator said ironically, Polish technique would jump "with the speed of light" over current problems—clothes, cars and telephones—and obliquely enter the Atomic Era.

•

**SELLING "THE SIZZLE NOT THE STEAK."** From Pacific Telephone & Telegraph Co.'s bill insert comes this one:

"A grocer friend tells us this story: A lady called him about an order and asked, 'Please bring some of your snap beans to the telephone.' He complied. 'Now break one,' she said.

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
*Since 1901*

**December 28, 1957**


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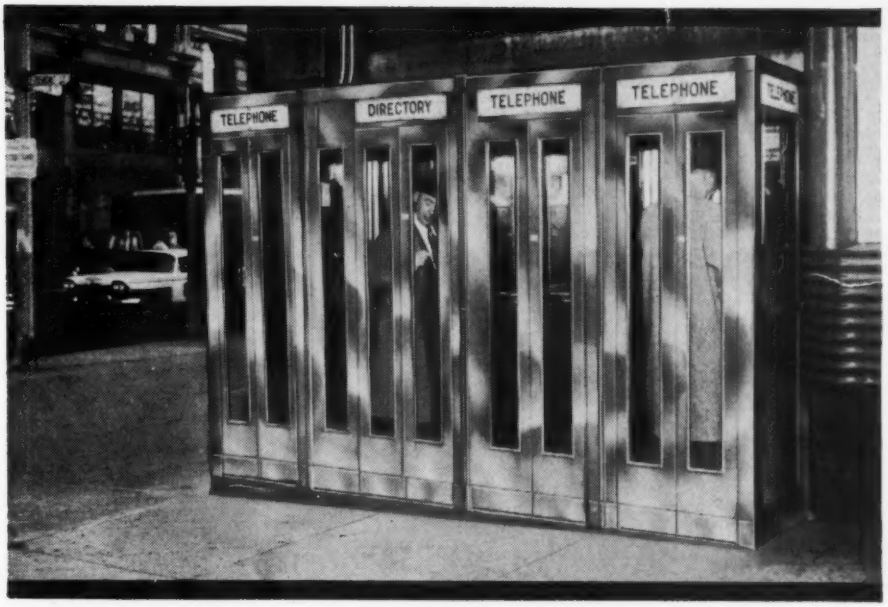


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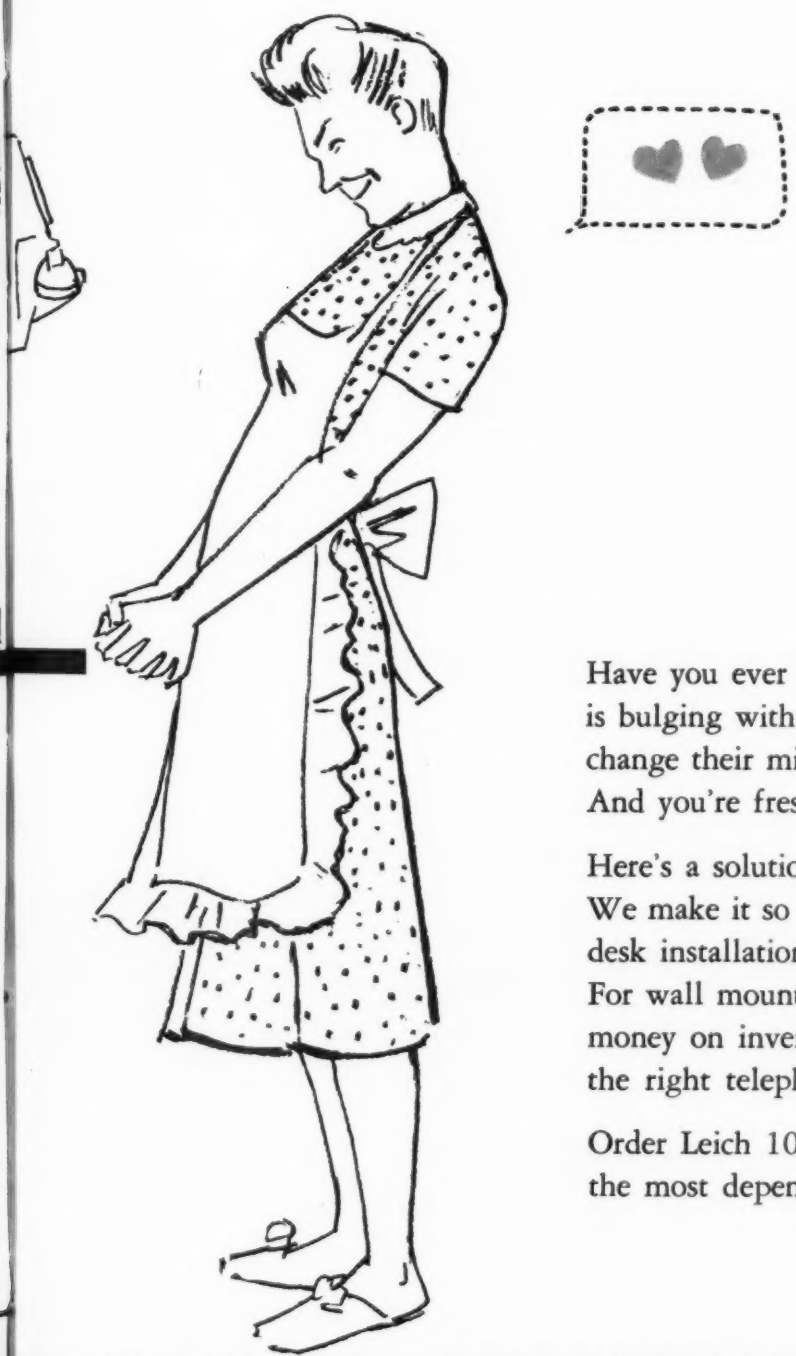

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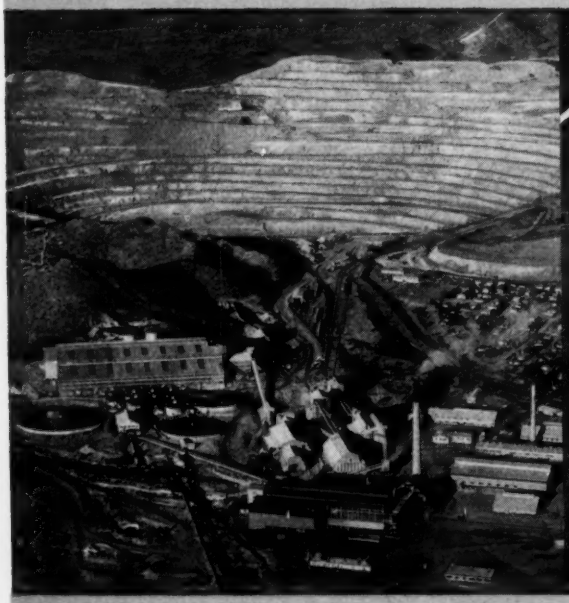

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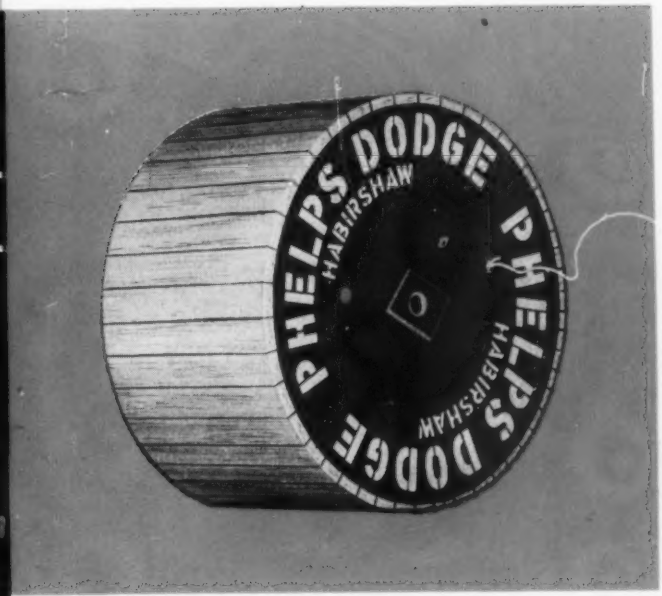


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Rural Telephone Service Co., Inc. (Kan.)

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# IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

**Welch makes predictions on Washington developments of interest to telephone companies. Gives himself a score of 80 per cent on the forecasts he made for the year 1957.**

THIS IS the season of good cheer and peace to men of good-will. In the traditional spirit this writer would like to extend to all readers and friends of this department greetings for a happy and prosperous New Year. It is also the season for your correspondent to trot out his annual prognostications of things to come during the New Year.

One of the difficulties about this business of forecasting the future, from the standpoint of telephone industry developments, is that the major issues do not change too much from year to year. In fact, sometimes they do not move at all. This makes it necessary to repeat certain forecasts for two or more years.

In this category must come forecasts as to the congressional outlook for labor legislation, tax legislation, and even the proceedings still pending before the Federal Communications Commission with respect to radio frequency allocations for the telephone industry.

If this writer had to choose a single item likely to prove most important and far-reaching in the future of the telephone industry, it would be these proceedings before the FCC. There are several of them and they have been going on for some time. What's more, some of them might go on right through the year 1958, which would leave us still up in the air a year from now as to whether the prediction was right or otherwise.

If the reader will be patient, therefore, with the slow progress of some of these matters, and bear in mind that the repetition of their appearance from year to year is not the fault of the prognosticator, the following 10 points of forecast may be read with interest, if not profit:

(1) *Labor Legislation.* There are at least four areas of possibility in which prevailing labor legislation could be changed so as to affect the interest of telephone companies. Two of these are in the federal law and two are in the state law domain. First, there is the perennial attempt of the Communications Workers of America (CWA) to have Congress wipe out the present exemption for wages of operators at small telephone exchanges (less than 750 stations). That would be by way of amendment to the Fair Labor Standards Act. The second federal item has to do with the National Labor Relations Act where attempts may be made to restrict control of union welfare funds by labor leaders as a result of recent disclosures by the McClellan committee in the Senate.

The prediction is made that any attempt to amend the Fair Labor Standards Act, with respect to the small exchange operators' wage exemption, will again fail. The reason is that the climate on Capitol Hill is not quite as pro-union as it used to be. The McClellan committee is responsible for this. But the result is that labor union proposals will not be received as sympathetically as was the case in former years. Indeed, labor union leaders, themselves, are seriously thinking of not pressing for any amendments or changes in any federal labor legislation for fear of rocking the boat, stirring up sleeping dogs, and otherwise opening the door for restrictive legislation.

The chances would seem to be at least even that Congress will enact some form of statutory discipline for unions which have custody over huge welfare funds. Other reforms likely to be suggested by the McClellan committee, such as restrictions on picketing abuses, strike violence, etc., will probably *not* be enacted during the coming year. Political influence of the labor unions is still too strong for such proposals to get anywhere during a congressional election year.

Moving now over into the field of state laws, we find that only a handful of the state legislatures are even meeting in regular sessions during 1958, so we cannot expect much, if anything, on either utility anti-strike laws or the so-called "right-to-work" laws. The recent New York City subway strike has set off a lot of new agitation and conversation about curtailing strikes against utility services to the public. But, such controversies have a way of dying down once the strikes are over. And, in the absence of legislative sessions, the outlook is for no new laws.

(2) *REA Rural Telephone Developments.* Your correspondent went wide of the mark last year when he forecast that REA might get 100 million dollars for new rural telephone loans. Actually REA only got an appropriation of 60 million dollars, plus a liberal carry-over.

Just by way of variety, the prediction this year is that REA rural telephone loans will be curtailed somewhat. This writer thinks that the new lending authority will be about 50 to 60 million dollars. Now, watch that contrary Congress turn about and vote 100 million dollars just to prove Welch is wrong.

The reason for the forecast, of course, is the administration's demand that non-defense federal expenditures be curtailed so that more money can be spent for missiles, foreign aid, and other defense items. This writer does not look for any change in the low interest rate of 2 per cent on REA loans, despite continued criticism because it cost the government more than 2 per cent to borrow funds for its own purposes.

(3) *Highway Relocation Laws.* During the legislative year of 1957 there

was quite a bit of activity in the field of state law proposals to permit public utility companies to be compensated for highway relocation expenses. In the box score on 1957 predictions, accompanying this department, it will be seen that less than half of the state bills on this subject were finally enacted.

But, the outlook for 1958 is for much less activity. First of all, as already noted, there will not be very many state legislatures meeting in 1958. Secondly, the Eisenhower administration's emphasis on defense spending may well slow up the highway construction activity. So the forecast is made that not more than three or four new highway relocation bills will be considered, and not more than one or two passed during the coming year.

(4) *Corporate Income Taxes.* Until the Russians started to bombard our rosy outlook with satellites there were some fond hopes that corporation income taxes might be cut without sacrificing a balanced budget in 1958. Today, those hopes have flopped. It is even questionable today whether a balanced budget can be maintained without raising corporate taxes.

(5) *Federal Excise Taxes.* As for the other tax in which the telephone industry has a more direct interest, the outlook is equally cloudy. This is the proposal to repeal or curtail the federal excise taxes on monthly bills and long distance toll calls now being collected on a 10 per cent basis. So great has the pressure become for the retention of all existing channels of federal tax revenues that any effort, however justified, to block or narrow these channels at this time is beset with extreme difficulties. Indeed, with the prevailing mood in Congress, it would appear that a somewhat different approach will have to be taken to reconcile the telephone industry's perfectly proper goal of eliminating these excise taxes.

If, for example, all the perfectly good and sound arguments for doing away with these excise taxes could be concentrated in an attempt to secure a commitment to do away with them *at some specified time in the future,* that would be real progress. One of the reasons why these telephone excise taxes go on and on is that they have never been tied entirely to a specified cut-off date like certain other excise taxes have been in the past.

With the state governments preparing to move in on the collection of at least part of these telephone excise taxes, some revised strategy to reach the industry's objective of tax repeal eventually, if not now, may be in order.

(6) *Investigation of the FCC.* Although the Federal Communications Commission is probably the most investigated agency of the federal government, considering that it is less than 24 years old, it is going to find itself in that familiar dart board position again in the year 1958. The reason is the Moulder committee of the House, otherwise known as the Sub-committee on Legislative Oversight.

The Moulder committee staff has been very busy collecting what it regards as evidence of irregularity, partiality, improper procedure, free loading, etc., on the part of various federal regulatory commissions and their staffs. Armed with files, records of calls in and out of federal bureaus, expense accounts, and similar alleged evidence, the committee plans to start its inquisition with the FCC.

This writer does not pretend to have any knowledge of what the Moulder

## Welch Gets 80 Per Cent on 1957 Forecasts

Following is the box score on predictions for 1957, and what happened to them after they appeared in this department of TELEPHONY, issue of Dec. 29, 1956:

(1) **Lots of Rate Cases.** It was predicted that the year 1957 would see a record amount of telephone rate increase applications, both as to the number of cases and the dollar amounts.

*Right.* The combination of inflation and tight money required both Bell and Independent companies to ask for increasing rate relief.

(2) **Not Many Regulatory Law Changes.** Although 45 out of 48 state legislatures were to have sessions, no great change in this field was foreseen.

*Right.* An original cost statute in Maine was offset by a fair value statute in Minnesota. The New York rate base law fight was a stand-off.

(3) **Not Much Change in Excise Taxes.** Because of the Treasury's need for revenue and a balanced budget, efforts to cut down or cut out excise taxes were viewed as unlikely to be successful.

*Right.*

(4) **No Changes in Corporate Income Taxes.**

*Right.*

(5) **A Tough Fight on Highway Relocation Expenses.** Although many bills to compensate utilities for relocation expenses were expected, a stiff fight and "a long hard pull" with not more than a dozen laws in 1957 was foreseen.

*Generally right.* Thirty-six bills were introduced, 15 were passed, some with restrictions; six were vetoed; and 15 failed to get through the legislatures.

(6) **REA Developments.** A hundred million dollars for REA telephone loans, with more private companies borrowing, and criticism of REA's 2 per cent interest rates were foreseen.

*Partially right.* REA got only 60 million dollars, but there have been many more private company borrowers (363) than cooperatives (205). And the 2 per cent interest rate, while under attack, has not been changed.

(7) **Labor Legislation.** No utility anti-strike laws in the states and not much progress on "right-to-work" laws was expected.

*Right.* This was a fairly quiet area of controversy.

(8) **Telephones and the FCC.** The important radio frequency matters involving telephone companies before the FCC was stressed with final action favoring the telephone companies expected during the year.

*Only partially right.* The important radio frequency cases are still pending.

(9) **Telephone "Appliances."** The U. S. Supreme Court was expected to reverse the decision of the U. S. Circuit Court of Appeals for the District of Columbia in the Hush-A-Phone case so as to protect telephone service from foreign attachments.

*Wrong.* The court did not even review the lower court decision. No appeal was taken.

(10) **Anti-trust Proceedings.** Congressional criticism of the consent decree ending the government's case against the Bell System and its subsidiary, Western Electric Co., was forecast.

*Right.*

committee has assembled. But, he knows enough about FCC and its staff to realize that it will be mostly peanut stuff. However, the FCC can look forward to some embarrassing moments on the carpet of the House committee hearings.

As far as actual legislative proposals to "reform the FCC" or to change the Federal Communications Act, this writer does not expect much, if anything. The investigation is already beginning to smack too much of an exercise of partisan politics. When that is apparent, no serious results can be looked for.

(7) *Mobile Radio-telephone Filings.* This writer expects the FCC to move finally on the long, drawn-out proceedings to authorize Bell System companies (and eventually other telephone companies) to file tariffs for rendering leased equipment services. The FCC has cleared away some underbrush in this proceeding by ruling that the language of the Bell System-Justice Department anti-trust consent decree of nearly two years ago does not prohibit the Bell companies from leasing and maintaining such service if it is found to be a proper common carrier operation subject to a regulatory jurisdiction. This leaves the next move up to the Justice Department if it wants to go back to the U. S. District Court and shop around for a contrary interpretation of the consent decree. In any event, there should not be too much more delay before the FCC decides this case on its merits.

The prediction is here made that the FCC will decide during the coming year that leasing and maintaining private mobile radio-telephone systems is a proper common carrier service, subject to the commission's regulatory jurisdiction. That being so, the tariffs will be accepted and one of the most formidable blockades against telephone industry expansion on the newly developing horizon of mobile radio-telephone service will be knocked down. There's still the appellate courts to think about after that.

(8) *The FCC Microwave Hearings.* No such prompt action is seen in the important microwave frequency hearings which were concluded last fall after going on most of spring and summer. There were so many parties, so much expert and technical evidence, and so many complicated exhibits that it is doubtful if the FCC can polish this one off, even after working on it throughout most of 1958. On the outcome of those proceedings will depend the future of important expansion of telephone industry operations in an

*(Please turn to page 41)*

## REA Approves Three Loans Totaling $2,100,000

**Rural telephone loans totaling $2,100,000 were among those approved by the Rural Electrification Administration during the week of Dec. 9. Details follow on these loans, which were allocated to three companies:**

**Prattsburg (N. Y.) Telephone Co., $139,000 (Dec. 9).**

**The borrower plans to use these funds to extend its service area into Seneca County and a fringe area of Schuyler County to furnish 395 rural families with new and improved service.**

**As a nucleus for the new service, the company proposes to acquire the Caywood, Lodi & Valois Telephone Co., Lodi, and two switcher lines from the Trumansburg Home Telephone Co. The facilities to be acquired furnish magneto service to 270 subscribers over 34 miles of line.**

**Scheduled construction includes an automatic central office at Lodi. The two loans to this borrower, totaling $723,000, will make possible new and improved service for 1,933 rural subscribers. The system, when complete, will consist of exchanges at Burdett, Lodi, Prattsburg, Pulteney and Urbana.**

**Herman H. Wagner is both president and manager of the Prattsburg Telephone Co.**

•

**Lycoming Telephone Co., Pine Grove, Pa.; $700,000 (Dec. 9).**

**The borrower proposes to use these funds to add a new automatic exchange at Loyalsock South to provide facilities to serve 301 new rural subscribers, and to complete the previously authorized system. Funds are also included to provide for an increase in the proportion of private and semi-private lines and to add extra toll trunks.**

**REA loans to this borrower, totaling 2 million dollars, will make it possible for the company to offer new and improved service to 5,617 rural subscribers. Eleven of the twelve exchanges are in operation.**

**Ralph M. Hyle is president of the Lycoming company, and Lewis C. Hyle is manager.**

•

**DeKalb Telephone Cooperative, Alexandria, Tenn.; $1,261,000 (Dec. 9)**

**The borrower plans to use these funds to furnish initial service for 965 rural subscribers, and to improve service for 905 existing subscribers. To accomplish this, the cooperative expects to expand its service area into Rutherford County and to serve additional territory in Cannon and Wilson counties.**

**As a nucleus for the new service, the borrower intends to acquire the following telephone properties: Norene Telephone Co., Home Telephone Co., Woodbury; Home Telephone Company, Readyville; Statesville Telephone Co.; and the Milton Telephone Co. These facilities are now providing common battery and magneto service to 905 rural subscribers.**

**New facilities scheduled to serve the expanded area include automatic central offices at Milton, Norene and Woodbury. The borrower expects to retain the existing Woodbury building for office purposes, in addition to the regular business office in Alexandria. Funds are also included in this loan for warehouse and garage facilities.**

**Total REA loans to the DeKalb cooperative amount to $2,180,000 with which it will be able to offer new and improved service to 3,831 subscribers. The system will consist of nine exchanges. The Alexandria, Auburntown, Gordonsville, Liberty, Smithville and Temperance Hall exchanges are in operation providing automatic service to approximately 1,400 rural subscribers.**

**James E. Simpson is president of the DeKalb Telephone Cooperative and E. D. Hildreth is manager.**

# Design and Operation of Small Companies

*By R. J. POLLOCK*

## Part 9
## Rural Plant Design

RURAL TELEPHONE service of the quality provided in cities was not demanded by the average rural resident in the not-too-distant past. Noisy lines and service outages were taken for granted. However, the rapid rise in the standard of living in the outlying sections has radically changed the picture so that, now, a large majority of people in the rural areas demand service equivalent to that rendered within the urban area.

This is as it should be, since any subscriber has the right to talk to any other subscriber, anywhere, at anytime. Storms and other unavoidable conditions may interrupt the privilege for short periods, but telephone facilities must be designed so that a clear two-way voice path is available. The demand for more modern rural service brought problems to the older magneto exchanges, even though they were operating on a 24-hour basis, since many telephone company owners were of the opinion that "metropolitan service" could not be rendered in all of the rural territory.

Pressure from the public and regulatory commissions for improved service, coupled with the industry's desire to sell more and better service, has resulted in the development of materials and equipment far superior to that of a few years ago. It is true that rural open wire facilities, in general, have the same appearance as in the past, but the parallel ends there since the new facilities are now designed to conform to present-day service demands. Providing modern rural service requires efficient and up-to-date telephones and line facilities which, when connected to the exchange cable, will supply a circuit capable of fulfilling service requirements.

It is not our intention, in this discussion, to cover the detailed methods to be followed in constructing rural facilities, but rather to outline the procedures which, if followed, will result in a grade of service equivalent to that demanded by the rural customer.

In many cases, the return on rural plant investment in itself, will not be adequate, but since it is an integral part of the over-all exchange picture, the service demands will be the same regardless of the cost of any or all lines within the operating territory.

Long-span construction has reduced pole costs per mile considerably and the use of high strength iron wire has permitted further reductions in those locations where terrain and weather conditions are not a governing factor. In the past, the standard practice was to locate the pole lead on the fence line or near the right-of-way limit, thereby eliminating easement costs and minimizing tree clearing operations. However, the increased traveling by the American public has made necessary many highway rehabilitation programs which, in many cases, result in an increase in the width of the traveled portion of roads, which can only be handled by widening the original right-of-way. However, it would be folly to assume that future highway requirements can be accommodated on present rights-of-way. In any event, whether a new roadbed is established or the original one is widened, telephone pole leads must be moved, resulting in the loss of the labor invested to build the original leads. In wooded areas, the capital charge expended for the first clearing of the right-of-way is also retired from plant and an additional expenditure for the same purpose will be required in the new location. In addition, service outages will occur during the pole moving operation which are difficult to determine on an actual cost basis, but they do have an adverse effect on public relations.

In many instances, power company or other utility poles can be contacted, which will eliminate the right-of-way problem as far as poles are concerned. Any road move, however, will require that the wire plant be transferred to the poles on the new location which, in wooded areas, will entail additional tree and brush clearing costs. When power company facilities are used, it will also be necessary to place additional protection in the wire plant to reduce the possibility of damage. Protective units for this purpose are available in sizes which conform to the voltages involved. Joint use of poles by telephone companies and other utilities is economical where trees, buildings or other obstructions make it costly to continue along the same side of the road. However, the practice should be limited to those cases where necessity is the governing factor and not because it is a more expedient manner to supply service to a location along a public road or private right-of-way.

The above suggestions are made on the basis that an existing line is to be replaced because most of it is approaching obsolescence, which, in many instances, will be the case. On the other hand, of course, any lead which has been maintained properly will have had some pole replacements, so that at the time of rebuilding many poles will have a remaining life period in excess of five years. In those cases, only spot pole replacements can be made, placing the lead in condition to carry the additional wire load resulting from new business and reduced line loads. A plan of this kind should be followed rigidly where possible, even to the point where poles with expectant life of less than five years are in effect, especially if rebuilding money is at a premium.

In order to arrive at a total cost figure, the plant design work should be recorded on a suitable map which will supply the data for labor and material calculations.

The accompanying *Fig. 7* shows a portion of a suggested map depicting various conditions which should be duplicated on the complete map to supply the information needed to construct all the rural plant within the operating territory. It is a completed version of the map shown in *Fig. 1* in the first article of this series (Oct. 12 issue), and can be used for material calculations and for the actual work to be done to accomplish the rebuilding program.

The location on the map indicated as T-1 is the north cable terminal shown in *Fig. 5* of Part 8 of this series (Dec. 7 issue). The open wire lead beyond that point is shown as a heavy line with arrowheads at each end to indicate the length of the section. The pole heads to the left indicate an existing 10-wire crossarm lead which will be increased to two arms, with eight additional wires to be added. The 2-inch per mile scale of the map will show

that the section is 0.75 miles in length and will, therefore, require 6 miles of wire to construct the proposed circuits in it. The figures below the proposed pole head indicate that 11 poles will be replaced in the section consisting of 9 class 7-20, 1 class 7-25, and 1 class 6-30 foot poles. Blazing all poles to be replaced will eliminate all guesswork as to their exact locations.

The light single arrow-headed line breaking to the left at the first mile-road intersection indicates a two-wire bracket lead on which no work will be performed.

The heavy line continuing north, as before, indicates additional facilities and an additional circuit will be added on brackets on a lead running beyond the limits of this map, along with pole and anchor replacements as shown below the proposed pole head.

The lead shown on the left hand side of the map to the J. T. Jones residence indicates that contacts should be placed on power company poles beyond the T. C. Brown residence to supply service to that new customer.

Telephone numbers shown are those of existing customers which will be regrouped as indicated by the light enclosed line.

The open circles indicate prospects who might be expected to apply for service in the future.

Actual data secured from field studies of each section of lead in the exchange area will be necessary, as discussed in previous articles, in order that an accurate estimate can be made.

Consideration of all regular and irregular factors encountered in each mile section will (if given proper study at the time the field work is done and properly recorded on the working papers at that time) permit the preparation of an estimate which should closely approximate the actual expenditure for the completed job. In far too many cases this phase of the work is done on a generalized basis, under the supposition that all conditions are the same throughout the rural area, with the result that the actual expenditure is far in excess of that estimated.

If, then, this map is prepared on a scale of not less than 2 inches per mile, it will show all lines and will permit calculations to determine whether or not the longer loops are within the switchboard operating limits. If not, the necessary material changes can be made by specifying Copperweld wire in place of iron, the substitution of high efficiency instruments, the addition of long lines equipment or a change in the gauge of all or part of the feeder cable. Any of these changes, or a combination of them, will result in a circuit design capable of supplying an acceptable grade of telephone service, the additional cost of which, if any, can be incorporated in the estimated cost figure.

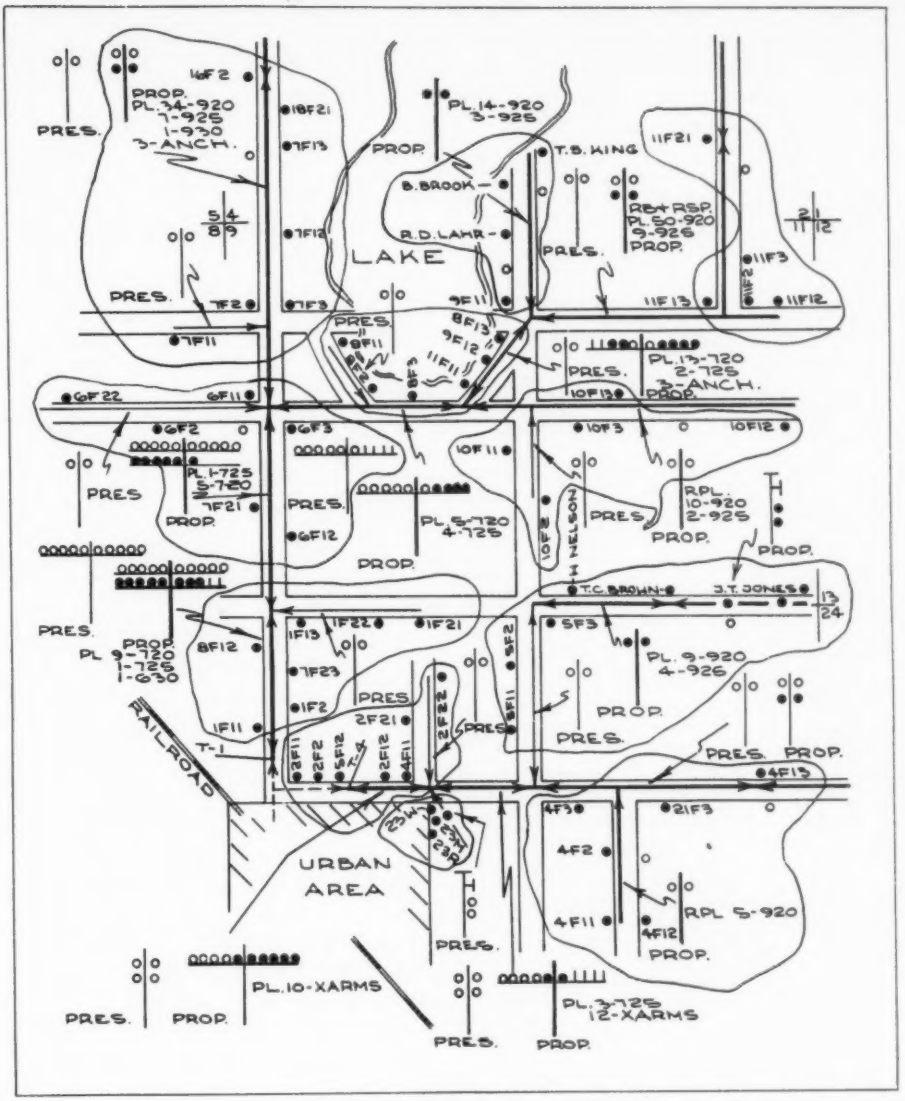



Fig. 7

Actually locating all existing prospective customers on the map will permit the design of a pole lead, the size and location of which will permit future circuit additions at a minimum cost in time and money. Past experience has shown that this is an important consideration which, if not properly studied, can result in plant sacrifice far in advance of the normal expected period.

The location and extent of all wire contacts on "foreign" poles should also be indicated so that the proper over-all study can be made to determine the effect they will have on the future circuit picture. The existing circuit requirements may be such that it is more economical to contact an existing "foreign" lead; however, the future prospects, as shown on the map, may ultimately require circuits in excess of the carrying capacity of the "foreign" lead. This condition could require plant sacrifice and removal costs, along with the costs of transferring all existing wire facilities which would go a long way when compared to those required to construct a company-owned lead in the first place, even if we do not consider the annual space rental cost. However, contacts on power poles on the far ends of long lines should not be considered, since problems might be encountered on the receiving circuit which cannot be overcome, resulting in many "can't hear" complaints.

In some instances, savings can be made by rerouting leads to feed given locations which will permit the elimination of some poles required to feed different locations adjacent to the main lead. This could result in back-feeding some locations which is not considered good practice, especially from the transmission standpoint. The objection should be given consideration in outlying locations where circuit conditions

are approaching the limit for normal operation. However, in some intermediate areas where two main leads supply adjacent territory, considerable money can be saved by constructing a main feeder lead and branching from it to the locations on both sides. While the plan will eliminate duplicate pole lines, it may require construction on private right-of-way or roads which, because of weather, are not open to travel throughout the year; therefore, the problem of maintenance should be considered, especially in areas subjected to inclement weather conditions. On the other hand, the out-of-way location could reduce the possibility of encountering road moves and other problems encountered on main highways. Examination of the plant map will give the information required to properly locate any and all leads, but in each case, where the circuits are of considerable length, the over-all loop calculations, as suggested in the previous article, should be made before the actual plan is adopted.

At this stage of the rebuilding program, the suggested map is used both for cost estimating and construction purposes. It should, therefore, show sizes of new poles as well as replacements, in addition to the locations of the various leads, anchoring conditions which are not normal, along with pole head diagrams. If these diagrams show both present facilities and those that will be in place when the rebuilding work is completed, they will permit easy figuring of the amount of material needed to do the job.

One of the main objects in a rebuilding program is to supply receiving and transmitting loops to each customer which will supply transmission characteristics at a level required by present-day telephone usage. The determining factor here is on the toll basis, rather than the exchange basis, and it will require consideration in direct proportion to present or future participation in the Direct Distance Dialing (DDD) program.

It is not possible to compute the transmission loss for all circuits in all customer-to-customer connections because of the many changing conditions which are encountered. However, the main losses in any circuit are quite firmly established and, if cable and wire lengths, as suggested in this series of articles, are not exceeded, normal transmission will, in most cases, be realized. This is dependent on the losses resulting from line noise which could defeat the over-all results if it is excessive. Consequently, steps must be taken to reduce this condition to the lowest possible level.

Normally, this is handled by installing suitable transposition schemes in all open wire circuits, generally, an R-1 scheme on leads carrying only telephone wires, and an R-2 scheme on leads adjacent to power facilities, will supply the necessary results. Satisfactory transmission performance on circuits carrying short-haul subscriber carrier systems, unattended dial office trunks, and extended area facilities can be handled in the same way, although the exchange conditions may require the substitution of a different transposition scheme.

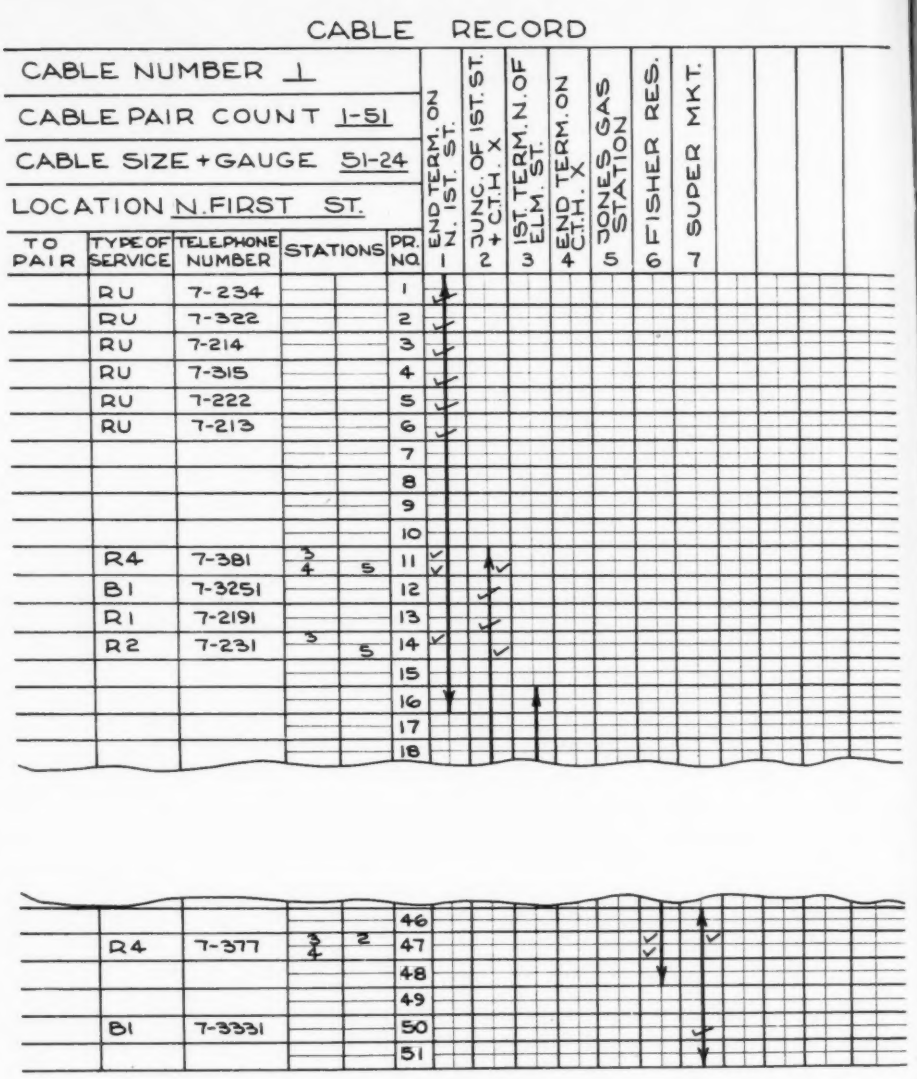



Fig. 8

Uniform separation between power and telephone facilities is a necessary prerequisite on jointly occupied pole leads to reduce the noise volume due to induction. If this is not done, excessive circuit noise will be encountered because of the inability of the R-2 transposition scheme to compensate for the variations in the intensity of the electromagnetic field.

The change from magneto to common battery or automatic operation will also necessitate the elimination of phantom circuits since they will not function over energized circuits. Composite equipment can be secured to supply them but their cost is such that it would not be economical for the smaller companies. Grounded voice circuits should also be discontinued.

Rural distribution wire which is composed of plastic insulated conductors up to 16 pairs, interwoven around a supporting wire, has received wide acceptance in locations where open wire cannot be used and in those instances where additional wire facilities are required for temporary use. Terminals for this type of construction are available down to one pair, along with simple pole attachment hardware so that a quick and economical installation can be made. The use of this type of construction instead of regular cable in rural areas should be studied carefully since it is more susceptible to physical damage and will impose transmission problems not encountered in open wire.

Earth conditions, such as sand or rock, which will affect the placing of poles and anchors, along with other conditions affecting the actual delivery

of poles, crossarms and hardware to the job, will have a direct bearing on the cost of placing each of these units. Sand or light gravel conditions will permit the use of light weight farm post hole digging equipment which can greatly reduce the labor cost of placing poles and anchors while, on the other hand, rock conditions will result in higher installation costs, even if heavy power digging equipment is used. The availability and cost of local labor will determine the most economical course to follow even if contract crews do the work.

Local terrain and right-of-way conditions will affect the labor cost for placing open wire but, if these are studied in advance, fairly accurate labor cost units can be determined for the outside plant.

A material sheet showing all material to be used on the rebuilding job should be set up according to the various codes, such as pole line and wire plant, with each list showing any and all items which will be used. If material for each mile of plant to be built, or rehabilitated, is shown on the appropriate sheet, a complete material picture will be available. Right-of-way and clearing costs, along with plant removal costs, should also be set up under the various accounts.

If all the above suggestions are considered, unit-in-place prices can be set up for the complete rural plant, which, with proper loading to compensate for other actual costs, will give an accurate cost of the rebuilding work as far as the rural outside plant is concerned. A detailed study can now be made to determine the most economical procedure to follow in the actual performance of the rebuilding job; that is, should it be done by a contractor or by local labor. Normally, a small exchange does not have sufficient skilled help to perform a complete job if it is to be done within a specified period, and working equipment such as trucks and tools may not be readily available. However, many parts of the program can be done with local help if the proper supervision is available, such as pole and open wire work. Normally, such a procedure should result in a cost which would be below that experienced if the complete job were done on a contract basis. However, high local labor rates would have a bearing on the course to be followed.

The remaining plant not covered consists of the subscriber drop, station protector, interior wire and telephone, and the rehabilitation work done here will depend on the decision as to whether an exchange is to remain magneto or common battery or be converted to automatic operation.

Since many of the problems encountered will be common to all three types of operation, it is proposed that we handle the station problem on the assumption that the exchange will be converted from magneto to dial operation with full selective harmonic ringing.

In that case, all circuits will be energized by the central office battery so that many drops and station wire installations will have to be changed. This will include many installations composed of rubber insulated cotton covered wire which might test out properly during dry weather, but will not be satisfactory during high humidity weather conditions. Generally, it is advisable to replace all drops and interior wire with the new plastic covered wire, since it will reduce trouble conditions after the cut-over. This might not appear to be important at the time of rebuilding, but each customer will place more than ordinary emphasis on each case of trouble encountered, especially with increased rates made necessary by the rehabilitation or conversion expenditures.

In connection with a cut-over, the average labor expended to replace the drop and interior wire and to install a new telephone will require approximately three hours, while the time to remove the old telephone and the necessary testing should require approximately two hours per station. These units include traveling time to and from the telephone location. This labor expenditure, when compared to that which will be made to do the same work after the cut-over because of reoccurring trouble conditions, leaves little or no doubt as to which course is more economical.

The specifications for the new automatic board will govern the adoption of a telephone numbering scheme so that number assignments can be made for all exchange subscribers covering all types of service. One digit of the number indicates the ringer frequency of the harmonic system, and new instruments will have to contain ringers of the proper frequency to correspond with the number assignments. In other words, a four-party line will be composed of telephones having four different frequencies in order that each subscriber will receive an individual ring. The same condition applies to all party lines with the exception of rural circuits having five or more connected customers. Here, any two telephones can have ringers of the same frequency, but one of them must be connected to ring to ground from the opposite side of the line in order to establish the divided ringing principle.

Many magneto exchanges contain extension bells which, under this type of operation, will have to be changed to units of the proper frequency.

The station rewiring program will be in accordance with a predetermined cut-over procedure, which can be done in a number of ways, depending upon the plant involved, along with a policy decision on the part of the company.

In those cases where a new office has been constructed, along with a completely new cable plant, all drops and rural facilities can be transferred to the new cable. This will require placing a tie cable between the old and new offices of sufficient size to carry all working lines. It also will be necessary to place one or more half-taps between the old and new cables to permit continuous service during the transferring operation. After all drops have been transferred, the half-taps should be removed, which will cut the old cable out of service and all working lines will operate through the tie cable to the old office.

Insulating strips placed on the new main frame protector units will cut off each line from the new automatic board, and the removal of this strip and the lifting of the proper tie cable pair will permit actual dial testing of all lines before the conversion. In this way, each working line can be tested individually and, at the same time, each customer can be instructed as to the proper use of the dial telephone by actually placing a test call to the testman.

If those tests are carried out in detail, the actual conversion will be accomplished with little or no trouble. This plan will require leaving the old magneto telephone in place with a temporary jumper to the new dial telephone which can be installed on a permanent basis. At the time of the cut-over, it will be necessary for the customer to cut these temporary wires before dial operation will function. If proper instructions are given to the customer at the time of installation, most of them will perform the operation on time and in the proper manner, but do not expect 100 per cent cooperation, since numerous conditions will come up which will prevent some customers doing the job on time. A tag placed on the wire indicating that they should be cut at a specified time has been found to be very helpful.

The alternate to this so-called "customer-aid" plan is to transfer each line to the new office at the time of the cut-over. In other words, the conversion is accomplished one line at a time. This plan does not readily permit advance testing and customer instruction with-

*(Please turn to page 43)*

# TELEPHONY'S Traffic Engineering Handbook

**By Gilbert R. Brackett** **Dec. 28, 1957**

## Section 8
## Customer Usage

The dialing of any call is under the sole control of the customer. Therefore, it is essential that he be thoroughly familiar with the correct use of his dial telephone.

The trends of customer dialing performance calls for close watching. When faulty usage gets out of line or is on the increase, it is time to brush up the customer instruction activities. These activities generally depend upon the general quality of customer usage and the familiarity of the public with dial service.

The instruction of new subscribers is a continuous activity, generally taken care of by the plant man making the installation. The chief operator or her representative can further this public relation service by calling the customer and extending a welcome and expressing a desire to be of service at the same time reviewing the major instruction items.

Instructions for other than new customers can be conducted on an individual basis or by group coverage, the extent and need depending upon conditions such as a high level of faulty usage or the indications of individual needs.

Group education should cover a large number of users with uniform instructions put into operation as occasion offers. The need for such group coverage will find indication in the general level of results, heavily loaded equipment and at the time of conversion from manual to dial.

There are many sources from which information relative to faulty customer usage can be obtained—assistance calls, due to lack of familiarity with dial, and from service observations. The latter are not used for individual instruction until the line has been removed from the service observing loop.

The most prevalent types of customer dialing irregularities are: Wrong number, insufficient digits and dialing before hearing dial tone.

Traffic criticisms, intercepting calls, operator calls, repair records, business office contacts, calls at information positions, and many other sources, are rich veins of knowledge relative to customer dialing lapses.

When it is necessary to correct faulty dialing by personal customer instruction through the medium of visiting instructors, the number of instructors used depends on the service situation and on the amount of instruction needed.

Such instructors should be thoroughly trained. They should have a practical knowledge of dial equipment and be generally familiar with toll practices, commercial department operation and plant department activities.

The instructor should never make notes while in the company of the customer. Necessary entries on results of interview can be written at another time. However, notes should be transcribed as soon as possible after the visit so some of the details will not be overlooked.

When an interview is made by telephone, the instructor, through tone of voice, should display a helpful, friendly spirit. She should be a committee of one to welcome the new subscriber, expressing a willingness to be of assistance and should it seem appropriate, ask the customer for an appraisal of his dial service.

Should the customer indicate a difficulty brought about by improper dialing, the instructor should give the necessary instruction for correction. If there is no reported condition, a tactful introduction of the dialing trouble which prompted the interview will convince the user the instructor has his interest at heart.

Of course, the best procedure in dial usage improvement is to begin instruction before service conditions become serious, before the habit becomes fixed or indelible in nature.

Often, equipment overloads will bring about subscriber deviations from accepted practices. Heavy calling beyond the capacity of the equipment causes serious delays in dial tone, which, in turn, promotes "dialing before tone" and this ends up in partial dialing, permanent signals, increased holding time and decreases in the call carrying capacity of the equipment.

Extreme overloads are two types: (1) Unexpected traffic surges due to conditions such as storms, radio programs, utility failures and local catastrophe; (2) anticipated situations brought about by holidays, sporting events, special occasions and recurring daily overloads.

It is certainly management's responsibility to anticipate overloads when possible. Previous experience, past trends and existing traffic volume, station growth and trend in calling rate, advanced knowledge of special events and storm warnings, all can be anticipated and prepared for by setting up definite plans in advance to handle such overloads.

## Section 9
## Traffic Surveys

It is the aim of all telephone companies to provide facilities in quantities great enough and of such type that there is a relative balance between the quality of service rendered and the cost of providing that service.

The total calls made by a group of subscribers in an office follows no set pattern during the day. It is the traffic engineer's business to provide sufficient over-all facilities to bring about the grade of service, measured by accepted standards which will be satisfactory to the customers at a time of day when the equipment is under maximum demand. It is the business of the management people to see that the right number of operators are on the job to give satisfactory service at all hours of the day.

*(Section 9 will be continued next week)*

## ELECTRONIC CROSS-BAR SWITCH

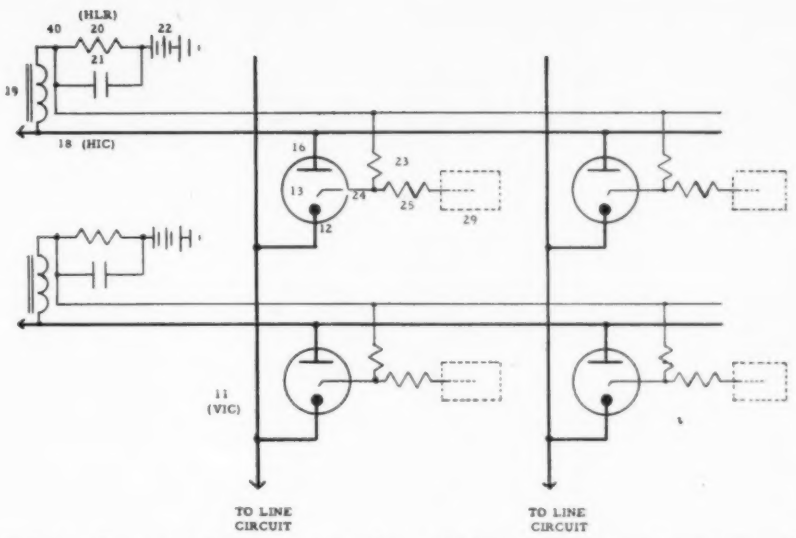
MANY patents have been issued in recent months, which pertain to electronic switching of telephone circuits. Often these do not make too much sense to the uninitiated because it is difficult to see where they fit into the picture. An exception is Patent No. 2,790,030 (See accompanying cuts), recently issued to Willem Six of the Netherlands and assigned to North American Phillips Co. It is of particular interest to telephone men because it resembles the crossbar switch in circuitry, and because it includes a complete function—that of connecting the line circuit to the central office linkage.

This device consists of a cross-wire array which might be likened to a crossbar switch, the contacts for which have been replaced by cold cathode triodes. This gas tube (13) has three elements, main anode (plate) (16), starter anode (24), and cathode (12).

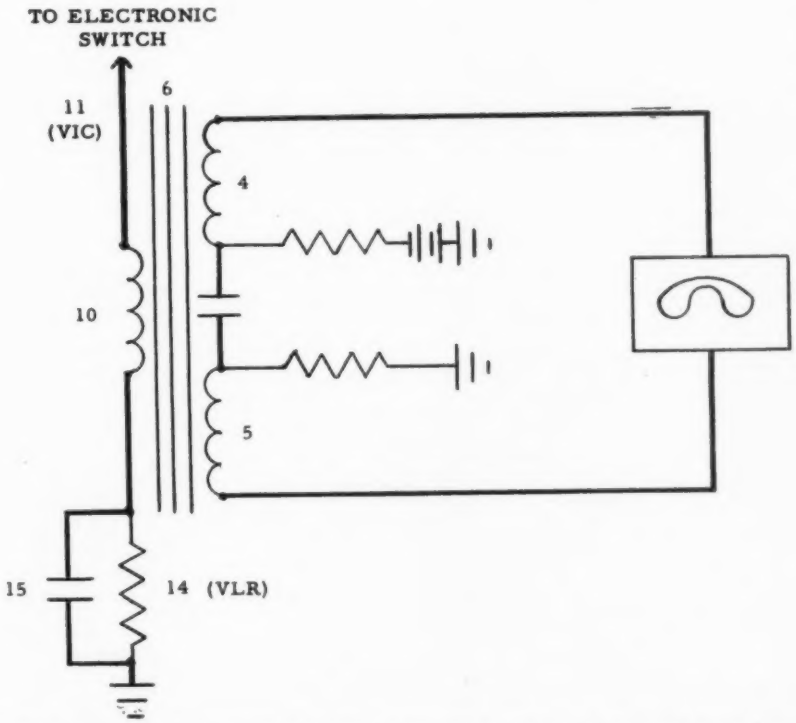
This tube, once fired, will remain in that condition, even if the voltage level is reduced. By means of a starter anode (24) this tube can be made to fire at a lower level than would be required for plate to cathode firing. The cross array consists of horizontal ("Talking Path") intelligence conductors (HIC) (18) and vertical ("Talking Path") intelligence conductors (VIC) (11). Each HIC is coupled to 160v positive battery (22) via isolating choke (19) and horizontal lockout resistor (HLR) (20).

There is a second wire which is connected between the choke and HLR at point (40) which is associated with each particular HIC. When the horizontal circuit is at rest, 160v appears on this wire; also by way of a voltage divider (23 and 25) and the output of a marking switch (29) the level of starter anode (24) is adjusted to just below firing.

The plate is connected to the HIC




*This is the equivalent of a crossbar switch in an electronic system. A pulse from the line circuit fires one of the tubes, connecting the line to the cross-wire. (Patent No. 2,790,030).*




*The subscribers line circuit in an electronic office would contain no relays. Removing the receiver (right) causes a spurt of current to flow momentarily in the transformer winding (10) which triggers the electronic switch (Patent No. 2,790,030).*



XUM

while the cathode is connected to the VIC. The VIC in this array is connected to the subscriber's line by way of the secondary winding (10) of the line transformer (6) and the vertical lockout resistor (VLR) (14). When at rest, the cathode (12) is at ground level. When the calling telephone comes off hook, it causes a negative-going pulse to be induced upon the VIC and appears on cathode (12) for the vertical which causes all idle tubes to attempt to fire. However, as soon as one begins to conduct, a voltage drop appears across VLR which raises the cathode level on all cathodes connected to VIC. This, in effect, allows only one vertical to be connected to one horizontal at a time.

This action also causes a drop across HLR and drops the level on the wire connected at point (40) from 160v to 110v, which in turn reduces the starting anode by way of the dividing networks of each tube connected to this particular HIC. This "busies out" the horizontal. The cathode level is raised to 50v when the tube is fired, thus making the vertical "busy."

On an incoming call to a subscriber, a marking switch (29) will raise the output at the particular intersection within the array, and if the VIC is in use, the cathode will be at 50v, and the tube will not fire, but if the line is idle the tube will fire and the connection will be established.

Within the electronic system it will be seen, a grounded circuit is used for switching and is connected to the subscriber's telephone by way of a transformer in the line circuit and a metallic line. (Drawing and circuit description by Gregory Currivan.)

## ELECTRONIC POSTOFFICE

IN 1956, the United State Postoffice handled over 48 billion pieces of letter mail, and the amount of mail has been increasing at an exponential rate ever since the postoffice started in business. Like the switching problems of the telephone business, the traffic volume is exceeding the ability of mere humans to handle it, and mechanization is needed.

The National Bureau of Standards has been assisting the postoffice in developing a system to alleviate the large-volume letter sorting problem. Under an idea now being worked out, mail will first be culled for letters of odd shapes or thicknesses, and then will be stacked right side up and with the stamps in the right position. The letters will then be fed in to the cancellation machine and then presented to "coding operators." These people will read the address and write up a code on a keyboard.

This code, in dot form, will be imprinted on the back of the envelope. The letter will then be mechanically transported to a code reader. The reader will produce electrical signals from the dot code, which will energize a translator. The translator will electrically direct the machinery to route the letter into the right bin for further handling.

This system will work at the originating postoffice, and the mail will be sorted and put into bins according to its destination. The contents of the bins will be transferred to sacks and delivered to the receiving postoffice.

At this office, a similar machine will route the letters according to the carriers districts. The same kinds of machine will do both functions. An electronic memory in the machine may be changed as required for new routings as the business expands.

The Bureau of Standards is also working on devices which will "recognize" the postage stamp on the envelope. Experiments are being conducted with fluorescent and phosphorescent dyes, magnetic and conducting inks.

## VACUUM TUBE MAINTENANCE

THE vacuum tube is probably the most unpredictable element in an electronic system. Its life expectancy is subject to wide discrepancies and a definite maintenance program is a difficult thing to set up. A telephone or telegraph company is concerned not only with the costs of replacing a burned-out tube (at an unattended microwave station on a mountain top, for example), but also with the lost circuit time which results.

If a definite life could be expected, tubes in vital spots could be changed routinely before they fail. Yet a certain small number of tubes fail in the first few hours of service. You might take out a tube which is good for a year and replace it with one which will fail tomorrow.

One approach to this problem has been made by the Bell System on certain carrier and repeater installations. The equipment is designed with built-in cathode resistors, the voltage drop across which is measured at routine intervals. As this voltage drop decreases from the original recorded value, the remaining life of the tube is estimated. Tubes which fall below a certain reading are replaced before they fail.

A plan for testing and aging tubes is described in the October, 1957 issue of the *Western Union Technical Review*. The plan calls for first checking new tubes on a commercial tube tester for mutual conductance, gas and shorts. Those which fail to pass certain standards are rejected on the spot.

Following this the tubes are placed in a spare radio or carrier unit (or a test panel with like conditions) where they are permitted to age for a couple of weeks at their usual operating voltages. The tubes are then tested again on the tube checker, and, again, those which now fail to meet specifications are rejected.

A notation is made of this second transconductance reading and a figure, which is 80 per cent of this value, is recorded for future reference. On later retests, when a particular tube shows a transconductance less than the 80 per cent figure, the tube is replaced.

With some types of tubes, a filament activity test is made, and those which show a decrease of 10 per cent are rejected.

Actually no set rule can be made for all tube types. Different kinds behave differently. Indeed, in some the transconductance may rise as the tube nears the end of its useful life. With some types, 9 per cent of the new tubes fail after the aging test; with others, less than 1 per cent fail.

(You can get the *Western Union Technical Review* for $1.50. Address: 60 Hudson St., New York 13, N. Y.)

## IDEAS WANTED

CAN YOU figure out some way to build a space platform for missile launching? Or a noiseless way to launch a rocket? Or how to keep a sleeping soldier from breathing moisture into his sleeping bag? If so, get in touch with the National Inventors Council of the U. S. Department of Commerce.

The above are just a few of the 380 technical problems affecting national defense, to which the government hopes to find answers. The list of problems is contained in a 34-page book entitled "Inventions Wanted by the Armed Forces" which is issued by the Office of Technical Services.

This book is published each year, and each year it seems to get larger and to probe into more mysteries. Many of the things wanted relate to the new rocket era, such as masks to protect people who may spill some of the high potency fuel. But, all is not atoms, jets and electrons.

Still wanted is some way to get more power out of a gas engine, an idea to keep locomotive wheels from slipping, a continuously variable gear transmission and a vehicle suitable for Arctic transportation.

In the communications field, the military needs everything from better amplifiers and rectifiers to a completely new communications idea, unlike present systems which use electrical impulses, electromagnetic or acoustical waves.

## CONTROL CRYSTALS

TELEPHONE carrier systems using the lower frequencies have traditionally used precision made coil-condenser combinations to maintain frequency stability. Quartz crystals have been used principally in the higher frequency systems. Now new low frequency duplex crystals are available for accurate control in the audio range from 4 to 15 kc.

They are made by the Reeves-Hoffman Division of Dynamics Corp. of America, Carlisle, Pa.

## CLOSED CIRCUIT TV

IN SPITE of resentment at first against closed circuit television (it reminded people of Big Brother), the art is rapidly progressing and new uses are being found. According to the Federal Communications Commission CC-TV is writing a new and spectacular chapter in the history of electronic communications.

CC-TV is a non-broadcast type of television which sends pictures only to sets which are connected by cable to the camera. It is used within buildings and over telephone lines to other buildings and even to theaters and hospitals all over the country.

While the use of this service for sending prize-fight pictures to theaters is known to everyone, it was medical instruction that really gave the system its initial impetus. Its early use was for hospital courses, but was later used to permit doctors around the country to watch surgical operations.

It is now used in schools, not only as a means of study, but also to keep an eye on students in study halls. Other uses include conferences between people in different parts of the country, verification of signatures or other identification chores, "sizing up" callers at a distance, spotting shoplifters, checking poachers on parking lots and even watching roulette tables in a Nevada gambling house.

Industrial uses include watching meters and gauges at unattended locations, supervising processes in areas hazardous for humans, detecting everything from chimney smoke to yard traffic, and certain underwater tasks.

Police organizations use CC-TV for everything from watching the "Line-up" (the real thing, not the commercial TV version), to checking auto registration information at centralized record locations.

Newest application may be "pay TV" where subscribers will have television entertainment piped to their homes through coaxial cable.

But whether this proves popular or not, closed circuit is here to stay. Because many of the applications involve transmission of pictures between separated properties, it looks like every telephone company, no matter how small may find themselves in the TV business. This will probably come about because telephone companies, even if they don't have the coaxial cable which might be needed, possess the poles to string it on. Some community TV antenna systems already rent pole space from utilities.

## WHERE AM I?

ONE OF the wonders of the electronic age is the TACAN equipment used by airplanes to determine their location. The airborne TACAN unit sends an interrogation signal to a ship or shore station which in effect asks, "Where am I?" The ground beacon figures out the answer and sends it back to the plane,



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which reads out the distance and bearing on instruments for the pilot.

Things like this have to be tested, and Stromberg-Carlson has just received a contract from the Navy to make this test equipment.

## MECHANIZED NOTIONS

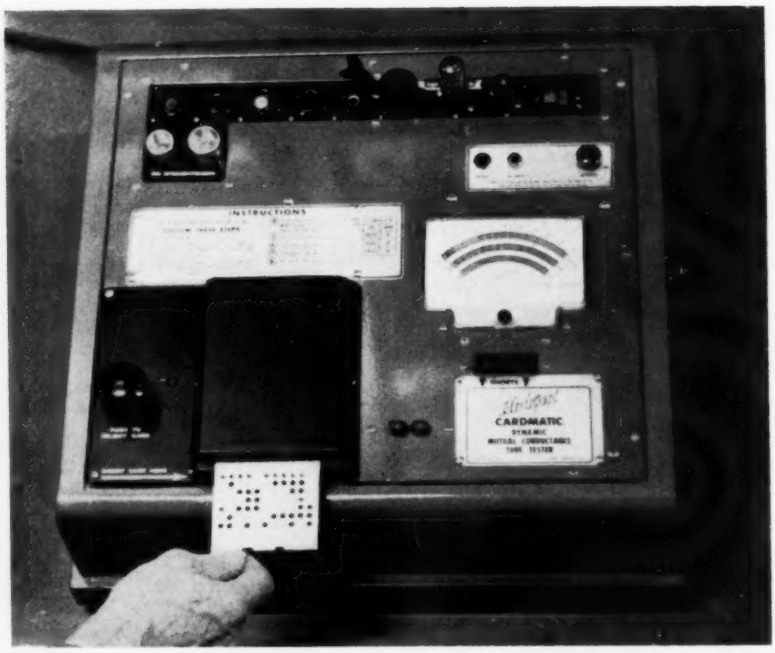
ANYONE who has tried to hunt up a reference in an old magazine knows what a frustrating matter a literary research can be. Today's science is adding to man's store of literary information at a tremendous rate. Librarians have so many indices to look at that they also have indices for other indices.

Now, IBM has tackled the problem and hopes to come up with a machine, which by means of special coding methods, will enable a researcher to find the facts he wants. Main problem is that human thought is not limited by mere words, or even solid ideas.

Rather, man gets notions, so the final problem might become one of making an index of notions. A suggested approach is that used in Roget's Thesaurus of English Words, in which thought is placed in broad categories.

## NEGATIVE IMPEDANCE REPEATERS

THE E type negative impedance repeater, first developed by the Bell System for short-haul transmission improvement, has been tailored to meet the needs of Independent companies. Now made by Hallamore Electronics Co., of Anaheim, Cal., the E-2 repeater can be obtained in a mounting which holds four units. It contains an ac power supply, hence does not require the 48-volt and 130-volt supply required by the original Bell version. The mounting is portable and can be used for temporary or permanent installations.




*An instrument that takes the guess work out of tube checking is the Hickok Cardmatic Model 123. It is not necessary to use roll charts or to set knobs for different tubes. The tube is placed in a socket, and a punched card is inserted in a slot. The instrument then tests the tube and registers "Good" or "Bad." The punched cards are prepared so that the test applied to the tube simulates the actual conditions under which the tubes would be used. (Landman photo).*

## LIGHTNING TROUBLE

THUNDER and lightning has long terrorized and mystified man. In addition, it has caused a lot of trouble with his communications. Because of the interference that static caused by atmospheric electricity brings to radio, the Institute of Radio Engineers decided to ask an authority to write on the subject. The result is an article, "The Electrification of Precipitation and Thunderstorms," by Ross Gunn, which appears in the October issue of the *Proceedings of the IRE*. Gunn is with the U. S. Weather Bureau.

Cosmic rays, radioactivity, corona and photoionization can all act to produce ion pairs, or electric charges, in the atmosphere. The ions may spread out and charge drops of water or ice crystals in clouds. Sometimes additional electrification by induction can occur. Rain which may result from the charged clouds will be highly electrified, and the charge may be brought closer to the ground by gravity.

The lower atmosphere is a semiconductor which is far from uniform in its characteristics. When a voltage, which is great enough to break down the dielectric strength of the atmosphere, is transferred close to earth, the lightning flash occurs. Potentials of as much as 100 million volts may exist, and the discharge may dissipate 500 kilowatt hours of energy.

## RELAY TERMS

MAYBE you thought there wasn't much to a relay besides armature, coil and contact, but Automatic Electric Co. has compiled a booklet of relay terms which lists about a couple of hundred different

definitions about relays. Included are a series of illustrations showing different spring pile-up assemblies and their proper coding and description.

You can get a copy of this book by writing to the Advertising Department, Automatic Electric Co., Northlake, Ill. Ask for Circular No. 1884 "Relay Terms."

## CAPACITANCE CHANGE IN TUBES

ENGINEERS at the British Postoffice Research Station are concerned with the performance of vacuum tubes, as new and more stringent application requirements are developed. An example of exacting requirements are those imposed by submerged repeaters.

Life tests of as much as 4,000 hours of operation are performed in the selection of tubes for the repeaters. In the course of testing such tubes, some interesting phenomena have been observed, among which is an increase in anode to grid capacitance. Normally, a vacuum tube displays a small capacitance between the various elements in the tube. This capacitance may be of little significance in some circuits. In others, it must be taken into consideration in the design of other capacitive elements in the circuit.

The effect observed by the postoffice has been that as a tube ages, the amount of capacitance between the control grid and the plate actually increases. In some applications, this can cause circuit disturbances. Studies of the tubes so affected reveal that the trouble is caused by carbon being deposited on the mica supports of the tube.

While some of the material which can be deposited in a tube might result from impurities boiling out of the cathode, tests indicate that the carbon deposit results from impurities in the plate. The trouble can be reduced by the use of heat-radiating fins on the plate structure. The impurity content of the metal can be greatly reduced by hydrogen-firing the anodes.

•

A SURGEON at work in a hospital operating room can get in instant touch with a supervisory nurse outside by means of a foot-actuated switch. The switch rings the nurse's telephone. The doctor's voice is picked up by a ceiling microphone. The doctor can order temperature changes in the room, or ventilation started as required. Minneapolis-Honeywell developed the system.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1.

2.

3.

4.

Automatic's Type 90 Wall Telephone in Camellia Pink

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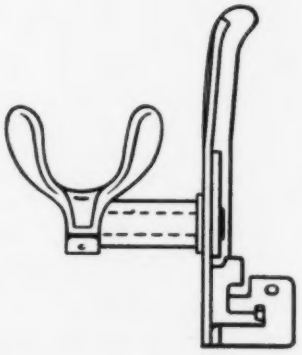
**1. No "off-hook" complaints!**

Our "wrap-around" cradle holds the handset secure—it's almost impossible to knock it off the hook. Yet the handset is easy to remove intentionally. And because the handset is side-mounted, Automatic's Type 90 Wall Telephone fits snugly to the wall.

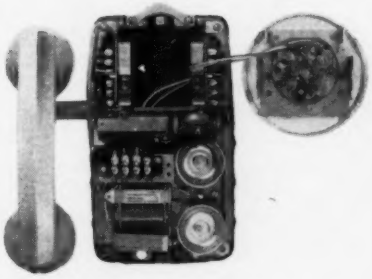
**2. No costly broken hooks!**

Type 90's metal cradle bracket is so strong we had a youngster chin himself on it. The cradle is a rugged die-cast metal and the hookswitch lever is inside a protective die-cast tube.



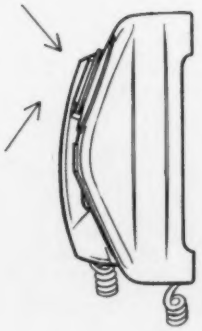
**3. Installation is a snap—and maintenance, too!**

Loosen one screw, the cover lifts off and you fasten Type 90 to the wall (handset stays in the cradle.) The loop compensator is adjusted from the front. With a screwdriver you can connect the line wires to the terminal strip. To remove the dial from its mounting, just push and lift. And note this: you can remove the ringer from the front—without taking the phone off the wall.



**4. Dialing is easier—standing or sitting!**

Whether you stand or sit, Type 90's special dial angle provides easier readability—makes full use of available light as well. This convenient dial angle plus the big, modern figures and guiding arrowheads assure faster, surer dialing.



**10 SPARKLING COLORS TO OFFER YOUR CUSTOMERS!**

Automatic's Type 90 Wall Telephone comes in a wide selection of colors to help you really cash in on extension phone sales. Your customers can choose from Classic Ivory, Sunlight Yellow, Turquoise, Dawn Gray, Sand Beige, Jade Green, Garnet Red, Gardenia White, Camellia Pink, and Forget-me-not Blue.

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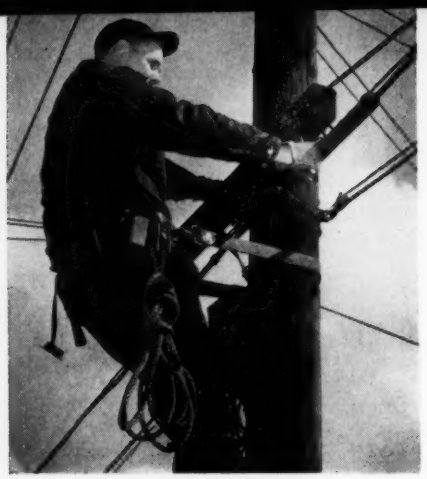

# THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

THE SIXTH Annual Symposium on "Technical Progress in Communication Wires and Cables," jointly sponsored by industry and the U. S. Army Signal Engineering Laboratories, was held in the Berkeley-Carteret Hotel at Asbury Park, N. J., on Dec. 3, 4 and 5. A total of 887 visitors registered and 162 companies sponsored the meeting.

Of special interest to telephone operating people were papers dealing with underground wire and cables and new cable splicing techniques. One such paper titled: "Design of Wire and Cable for Direct Burial in Rural Telephone Systems of REA Borrowers," was written by R. S. Bailey, C. R. Ballard, F. F. Farnsworth, and A. L. Richey, of the Rural Electrification Administration. This paper was presented by Mr. Ballard and cited the vulnerability of aerial plant, particularly the open wire portion of such plant to substantial damage from storms, which has always been of great concern to telephone companies, especially in high wind and sleet belt areas.

Up to the present time only limited amounts of buried facilities have been installed in REA borrowers' systems. Recently new types of wire and cable have become available, together with more economical methods of installing them which make buried construction competitive with aerial construction where soil conditions are favorable for plowing.

Under the heading, "Early Experiments with Buried Construction," the paper makes reference to the following:

"How different the trend in the development of outside plant facilities might have been if the very first communication line in this country could have been as planned!

"Back in the year 1843, Samuel F. B. Morse started to bury a 2-pair, 16-ga. fully color-coded lead cable for telegraph service from Washington to Baltimore. The cotton insulation proved inadequate for use in cables; hence the wires had to be separated and mounted on crossarms on poles.

"Had that line and its many successors been buried successfully, it is probable that aerial plant would have been frowned upon, even though it might provide equally satisfactory transmission at a lower cost."

"Buried Rural Telephone Distribution Systems" was the subject of a paper presented by the Southern Bell Telephone & Telegraph Co. It was coauthored by A. C. Benner, construction methods engineer; D. G. Wilson, engineer, and J. W. Davis, assistant vice president, who presented the paper.

After a tremendous postwar expansion program, Southern Bell was still faced with the problem of providing service to thousands of rural customers living in areas where conventional construction methods entailed severe cost penalties. For many years the potential economy of buried plant had been recognized, but early efforts were abandoned because of materials that were not entirely satisfactory and installation procedures that were inadequate.

In the summer of 1954, however, it was learned that the Michigan Bell Telephone Co., which participated in early trials of an aluminum-polyethylene-sheathed cable with polyethylene-insulated conductors (PIC cable), had successfully placed, during 1952, some 100 miles of 6-pair 19-gauge PIC cable in light soil. A wire laying plow pulled by a line construction truck was employed.

Based on this limited experience, it was concluded that PIC cable was a suitable material for direct burial. The economic feasibility, however, was still in question since more elaborate cable-laying machinery would be required in the heavy clay soil predominant in most Southern Bell territory.

At this point, it was learned that Southwestern Bell Telephone Co., because of high costs involved in the prevention of aerial cable dancing in high winds, had begun, also in 1952, an extensive cable plowing program involving conventional lead-sheath tape-armored cable. Southwestern's experience was, to a large extent, encouraging since plowing costs for cable laying had been reduced from 12½ cents per foot in 1952 to 5½ cents per foot in 1954. This was indicative of what might be expected in Southern Bell territory, since soil conditions are roughly comparable.

Beginning in September 1954, about 25 miles of one-pair underground wire and 4 miles of 11-pair 19-gauge PIC cable were buried. During 1955, over 11,500 rural subscribers in Southern Bell territory who otherwise could not have been accommodated economically, received telephone service from buried cable and wire. To do this required some 1700 miles of buried cable and 1300 miles of buried wire.

During 1956 and the first six months of 1957, an additional 3400 miles of buried rural cable and 1100 miles of buried wire were placed in service by Southern Bell, and the philosophy of buried plant substitution for aerial plant enjoyed increasing popularity. Southern Bell's use of buried PIC cable and underground wire for rural distribution plant is now well into the third year. Analyses indicate that "in-plant" cost of buried PIC cable is from 15 per cent to 30 per cent less than that of equivalent aerial plant, exclusive of pole line costs.

"Construction of Underground Distribution Plant" was the subject of a paper presented by C. H. Elder, outside plant engineer, state area of the Illinois Bell Telephone Co. In the introduction of the paper, he stated that complete underground telephone distribution plant is not new or original. It has been in use for many, many years—and has provided a very satisfactory and remarkably trouble-free plant.

Prior to the advent of a protective covering for lead-sheathed cable it was placed in conduit and spliced and ter-

minated in manholes or small handholes. Some companies in small communities had good success with plain lead sheath buried directly in the earth between houses, and running through basements or along rear walls for distribution purposes.

Cables suitable for burial in earth were developed in the late twenties which, together with pedestal-type terminals, opened a new field for buried construction. Within the past three decades, thousands of miles of intercity trunk and toll cables have been plowed or trenched in cross-country. Over the years, many high grade residential subdivisions demanded all buried plant and the telephone company was reimbursed for the excess cost over that for conventional aerial plant.

Based on trials in the Illinois Bell company, it is the general opinion that only modest improvements in trenching and backfilling equipment and construction methods are needed to make underground telephone plant, urban and rural, as cheap as aerial construction.

Even if this were not so, the savings in maintenance costs, public demand for better appearance, and greater safety will prove in buried plant. These conclusions are supported by many other companies who have given serious consideration to modern design and methods. In conclusion, Mr. Elder stated:

"If we miss our guess for future needs and must reinforce buried plant it will be expensive certainly, but in most subdivisions we know pretty well how many homes will be built in each block and we trust that eventually every home will be at least a one-party telephone user. We can't go far wrong if we design facilities on that basis.

"It is our contention that outside telephone plant, all underground, belongs in the era of the electronic switching machine."

A paper titled: "Experience with Self-Supporting Plastic Communication Cable" was presented by M. O. Brown, of the General Telephone Co. of Illinois. In his opening remarks, Mr. Brown stated: "The General Telephone Co. of Illinois is probably one of the largest users of self-supported plastic cable. We have an excess of 300 miles of this type construction in plant on an experimental basis and are adding to it constantly. So that you will have some idea of the problems confronting us which were instrumental in our decision to consider self-supported plastic cable for rural area construction, let us turn back a few years.

"When we made our initial trial installation of plastic cable in 1948, we served approximately 126,000 telephones from 218 exchanges spread over approximately 25 per cent of the land area of the state. Of these stations, approximately 26,000 were in the rural area which we estimate comprises 98 per cent of our operating territory. Mergers, acquisitions, and growth have increased our plant to where we now have approximately 320,000 telephones distributed over 35 per cent of the state's area.

"In analyzing the changes of the number of rural area telephones from 1948 to present we found that while growth has accounted for more than 70 per cent of the increase we have deloaded our lines in a number of exchanges from an average of more than 12 to an average of less than 8 subscribers per line with the net result that the number of lines serving rural telephones has more than doubled." In conclusion Mr. Brown stated:

"From the experience that we have had we are quite firmly convinced that a well-designed plastic cable will last many years. We find in self-supported plastic cable one of the most economical means of providing additional rural facilities.

"This type of plant has been proved to be easily installed, requires less maintenance than any other type of comparable facility and can be expediently removed and fully salvaged in the event service requirements increase beyond its capacity.

"While our experience with these trial installations has been most satisfactory we are looking forward to further development in the use of self-supported plastic cable. We feel that if the work we have done is instrumental in making another useful tool with which we can accomplish our prime objective—rendering more telephone service in the most reliable and economical manner possible—we have fulfilled our purpose.

"We would like to add that, from a user's standpoint, we see our present practices as merely the beginning of substantial developments in both methods and materials associated with the use of plastic insulated, plastic sheathed cables."

"Cable Splicing Goes Modern" was the title of a paper presented by W. C. Kleinfelder, of the Bell Telephone Laboratories. In his opening remarks, Mr. Kleinfelder stated: Each year, the operating companies of the Bell System add about 50,000 sheath miles of telephone cables to their outside plant. These cables vary in size from the smallest aerial distribution types containing six pairs of wires to the big feeder cables containing as many as 2,100 pairs, running in underground conduit systems.

"These cables are installed in lengths that range from less than 200 feet at one extreme to 2,000 feet at the other. A work force of more than 14,000 cable splicers must make more than 300 million conductor joints each year in splicing together several hundred thousand sections of cable.

"Although many construction and maintenance operations of the outside plant forces have been modernized, and although some have been highly mechanized, the techniques for joining cable conductors have remained virtually unchanged since the beginning of the telephone business. The time-honored method of joining two or more paper or pulp-insulated cable conductors is simple and requires a minimum of equipment."

Referring to the new method of conductor splicing, Mr. Kleinfelder stated:

"The groundwork for the new approach to the conductor-joining problem was laid by analyses of time and motion studies of the old method and of labor and material costs. Guiding objectives were developed as follows:

(1) Manual operations required should be kept to a minimum.

(2) Stripping of insulation should be eliminated.

(3) Needed parts must be inexpensive.

(4) It should be possible to join the various combinations of conductor gauges with a minimum number of sizes of parts.

(5) Any part used in the joint should furnish its own insulation.

(6) Power should be used to reduce worker fatigue.

(7) The method must be adaptable to the varied conditions of field splicing.

"The method finally developed involves slipping a sleeve over the ends of the two or three conductors to be joined, and 'punching' the sleeve between toothed dies in the jaws of a pneumatic tool, powered from the same tank of compressed nitrogen that the splicer uses to pressure test cables and splices.

"The sleeve consists of a tube made of the same metal as the conductors to be joined (aluminum or copper) with a jacket of plastic that is closed at one end. The punching operation deforms the sleeve wall and the conductors in such a way that a combination of shearing and compressive forces displaces the insulation, making metal-to-metal contacts. This operation produces punctures in the plastic covering of the sleeve. These punctures are not detrimental, however, since they do not lower the dielectric strength between the paper-insulated conductors. Because the jacket material springs out at the punctures, there is no possibility that the metal sleeves on two joints will touch."

"A Field Study of the Shear-Type Sealing Connector" was the title of a paper presented by E. W. Bollmeier, projects manager, electro-mechanical products division, Minnesota Mining & Manufacturing Co. A paper entitled:

*(Please turn to page 46)*



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**Officers and members of the board of directors of the Oklahoma Telephone Association are (seated, left to right): D. R. Majors of Carmen; Joe Trower of Mannford, first vice president; F. E. Messecar of Broken Arrow, and Jack Holt of Stilwell. Standing (left to right): Harrold Peterson of Roosevelt; S. C. Rich of Oklahoma City, treasurer; Leroy Guest of Davenport, newly elected second vice president; F. F. Wright of Kingfisher, president; A. L. McFadden of Ringwood, retiring president; W. E. Gosdin of Oklahoma City; Hugh D. Straughn of Oklahoma City, secretary, and R. E. Harris of Purcell.**

# Oklahoma Association Concentrates on Merchandising, Public Relations

*By Dan S. Fargo*

TELEPHONE industry evaluation of the buying public—both from a merchandising and a public relations point of view—drew concentrated attention at the 22nd annual convention of the Oklahoma Telephone Association, held Nov. 21 and 22 in Oklahoma City.

Forward-looking and informative talks on these matters furnished those who attended much valuable thought and data aimed at maximizing revenues from individual company service territories.

David A. Hamil, administrator, Rural Electrification Administration, in the course of his report on "Rural Telephone Progress," observed that some people have the idea that the REA loans money in all situations. However, he said, there are places in the country where it is difficult to loan money because the sparsity factor is too great.

He commented on the extent of delinquency in the telephone loan part of the REA program, saying there has been some, but that he was not worried about the extent of it.

Mr. Hamil urged consolidation of the smaller telephone systems so that the resulting larger companies can afford one or two technical men and modern dial service. Shooting at a goal of around 1,000 telephones was what he advised.

He also reminded his listeners that the REA is not making loans to patch up "barbed wire systems." REA does insist loans be for construction measuring up "to the very best standards known in 1957. So if you feel that REA policies are sometimes rigid, remember the policies have to work nationwide and our performance is watched closely by the public and Congress (it's like working in a gold fish bowl)."

Mr. Hamil stated that about 50 per cent of American farms now have telephone service. He added that it would be desirable to have telephone service extended to the most remote subscriber possible, if it were financially feasible.

A. L. McFadden of Ringwood, association president, in presenting his report, noted that Oklahoma telephone people are busy building their own type of satellite (other than the ones recently so much in the news)—the dial exchange variety. And, he said, there has been a healthy consolidation among operating telephone companies in the state, with stronger companies resulting (meaning better management, better supervision, etc.).

Among the many services performed by the association in the past year, Mr. McFadden included the stalling of certain damaging legislation; stabilizing the matter of territory filing; the achievement of partial success on the federal-aid highway relocation reimbursement fight, and important progress toward a group insurance plan.

The president of the United States Independent Telephone Association, Clive W. Haas of Big Timber, Mont.,

presented an address titled, "Horizons of the Future." He stated there is only one way for telephone people to look and that is ahead in view of the U. S. population estimates for 1975—225 million people—and for the year 2000 —300 million.

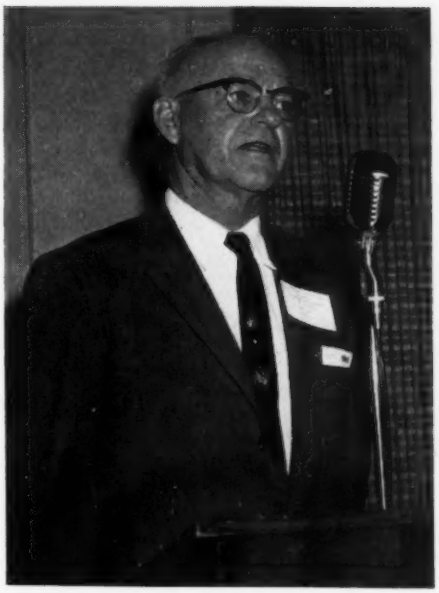
He listed many of the problems associated with the population rise—law enforcement, traffic, food and water. The telephone industry is affected in the areas of data transmission, control circuits on long distance pipe lines, as well as in the matter of furnishing local and toll service. He emphasized that the industry must maintain itself in a position to furnish those circuits, not after the demand is felt, but in anticipation of it. How well the industry succeeds will be largely determined by how it responds to the ideas now available and those being advanced.

Becoming increasingly untenable is the industry's 750-station operator exemption. Mr. Haas stated the USITA is doing everything possible to prevent its being dropped till all smaller Independents can cut over to dial service. He said it has been estimated that if all companies decided to convert to automatic operation, it would take 10 years to complete the conversion.

Mr. Haas mentioned that the USITA is continuing the toll compensation committee studies, which have heretofore proved so worthwhile.

He also outlined the USITA's need for new members, both from the spur it would give the association financially and from the additional influence it would afford.

George W. Griffin, of the Hardware Mutuals Insurance Co., in his "Brief Outline of the Oklahoma Telephone Association Group Insurance Plan," told of the two plans for hospitalization coverage under consideration.



**Clive W. Haas of Big Timber, Mont., president of USITA, addressing Oklahoma telephone people.**

Results of a survey conducted by the Bell System to determine the characteristics of the market for telephone service were presented by Ben Smith, general merchandising manager of Southwestern Bell Telephone Co., in his talk on "Merchandising—the Market and the Opportunities." The study included such matters as:

Where the telephone is used.
What people use it.
Why they like it.
Design and pricing of instruments.
What words are used to sell telephone services.

**At the head table for the ladies luncheon during the Oklahoma telephone convention, were (left to right): Miss Dena Lee Jones of Oklahoma City, an entertainer; Mrs. W. K. Aubrey of Jay; Mrs. Joe Trower of Mannford; Mrs. Forrest Hand of Beggs, and Mrs. O. H. Mullen of Inola. The latter four ladies comprised the ladies entertainment committee.**

Mr. Smith mentioned some sales techniques found by installers to be effective—using the prospect's name; carrying two telephones, one in color, on an installation visit, and in general being alert to the merchandising opportunities existing on a personal call.

Since 9 per cent of one-telephone homes were found to have the instrument in a bedroom, and 74 per cent of multi-telephone homes have one in a bedroom, it would appear to be rewarding to try to sell the one-instrument home a second telephone for use in the bedroom, he said; and the kitchen is the next leading prospective location.

Among other conclusions or findings were:

It's easier to sell the third telephone to the person with two.

Forty-three per cent of those surveyed didn't know the cost of an additional telephone.

Growing out of the preceding point was the idea for offering three telephones on the first installation, stressing, instead of one for $6.00, three for $8.00.

Fifty-six per cent prefer color telephones over black before hearing price or seeing instruments; this figure dropped down after price disclosure, but went back up to 33 per cent after those surveyed saw the colored instrument.

Though the two-telephone family pays more money for the service, they like it better, feel it is more of a necessity, and consequently will be more likely to retain telephone service in adverse financial circumstances.

Ninety-two per cent of those surveyed said they never had been asked to add additional telephones.

Southwestern Bell has made a survey of telephone service potential in its rural areas and Mr. Smith, in reporting results, stated that a high percentage consider the telephone an absolute necessity. It was found, too, that a sizable number don't like eight and 12-party service.

Of the farmers surveyed 69 per cent stated that one-half or more of the cost of telephone service is an income tax deduction as farm expense.

The barn and the machine shed led the list of places farmers said they'd like to have additional telephones. Mr. Smith emphasized: "Put telephones in convenient locations for farmers and you'll reduce party-line complaints."

"Business Decisions that Affect Your Tax Return" was the subject spoken on by Roy Thomas, of Tulsa, Okla., certified public accountant.

"The most effective public relations are exerted through personal contact and a small company has a great advantage over a larger company in this respect," said F. E. Hightower of San Angelo, Tex., in prefacing his remarks



XUM

on "Public Relations—Not What But Why."

To show the importance of public relations in the telephone industry's present and future, Mr. Hightower said:

"In the first place, let's consider the rate of growth of our nation, population-wise. Two hundred twenty-seven million people by 1975—that's what most forecasters say is going to happen during the next 18 years. The Southwest is going to get a leading share in this new business when the "shift" or "moving" of present population is taken into consideration also.

"If we're going to have facilities to serve all these people as soon as they want service and if we can give them the type of service they want and if our rate structure will permit us to earn sufficiently on the plant we use to provide these services, then perhaps we don't need to worry about public relations. In fact, I don't suppose we have anything to worry about.

"But if we follow the more logical pattern we must realize some of these conditions might mean trouble on down the road. We can draw on our own experience to tell us what might happen. During the last 12 or 13 years we've already had a taste of the demands created by a growing population. Maybe we can use public relations to avoid or at least smooth some of the bumps we know will be ahead in the telephone business.

"We might even want to use some public relations on our own people to help them see the picture of what's ahead.

"Then of course if we're not ready with all of these things, we might use public relations to tell our side of the story in the way it should be told.

"We will also probably want to explain why we've done what we have and what our plans are to meet the needs of the future."

Mr. Hightower mentioned that changing income patterns and a rising standard of living are leading to additional opportunities for selling telephone service. He also saw the public relations department having an important place in consumer surveys of attitudes about, and desires for, the services telephone companies offer.

Taking note of the large and increasing proportion of the U. S. population which is under age 9, Mr. Hightower stated that the telephone company here has an opportunity to exert its influence on a whole new generation of potential customers. He said in view of engineering and traffic changes on the horizon, here is a prime group to impress with the ease of long-distance calling, and with the convenience of a telephone in every room in the house.

Public relations will also play an important role assisting the industry to alleviate the shortage of competent and skilled personnel felt today throughout the industry. And, with the technological changes certain to come in all industries, needs for high-quality personnel are going to be intensified, he said.

Mr. Hightower also observed: "It seems to me there is still plenty of room to apply some public relations in the direction of the regulatory agencies," especially where, as sometimes happens, there is "open hostility on the part of some regulatory agency toward requests for rate relief."

On the aid public relations can give financing efforts, Mr. Hightower said:

"Here again telephone companies are faced with the matter of obtaining their share of the investment capital available from the public. There just isn't enough to go around to give everyone all the financing they would like to have. So there is competition for that, too—and in any type of competition, it would seem to me that we can apply some public relations.

"The past financial history of our company and the way in which it is managed, of course, is a great determining factor on how much financing we can obtain. However, not everyone who buys shares in American enterprises is a financial expert and I am sure many people buy on reputation or because they are favorably impressed with a company or it has been favorably brought to their attention in one way or another.

"I think it has been sufficiently proven in many instances that we can attract investors to our business by a well-planned program of public relations."

The concluding talk came from O. E. Hopkins, communications consultant to the Civil Defense Survival Project for Oklahoma, and covered "Communications Requirements in Cases of State Emergency."

The association elected as directors Leroy Guest of Davenport; R. E. Harris of Purcell, and D. R. Majors of Carmen.

Other directors are W. E. Gosdin of Oklahoma City; Jack Holt of Stilwell; A. L. McFadden of Ringwood; F. E. Messecar of Broken Arrow; Harrold Peterson of Roosevelt; Joe Trower of Mannford, and F. F. Wright of Kingfisher.

The directors elected the following officers:

President, Mr. Wright; first vice president, Mr. Trower; second vice president, Mr. Guest; secretary, Hugh D. Straughn, and treasurer S. C. Rich, the latter two of Oklahoma City.

## 1958 Convention Calendar

| *Association* | *Date* | *City* | *Hotel* |
|---|---|---|---|
| Louisiana | Feb. 12 and 13 | New Orleans | Jung |
| Minnesota | Feb. 17, 18 and 19 | St. Paul | St. Paul |
| Texas | March 3 and 4 | Dallas | Baker |
| Kentucky | March 4 | Lexington | Phoenix |
| Iowa | April 8 and 9 | Des Moines | Fort Des Moines |
| Ohio | April 14, 15 and 16 | Columbus | Deshler-Hilton |
| Nebraska | April 22 and 23 | Omaha | Paxton |
| Indiana | May 7 and 8 | Indianapolis | Claypool |
| Wisconsin | May 14 and 15 | Milwaukee | Plankinton House |
| Illinois | May 21 and 22 | Peoria | Pere Marquette |
| Kansas-Missouri* | May 26 and 27 | Kansas City | Town House |
| Pennsylvania | May 26, 27 and 28 | Bedford | Bedford Springs |
| Maine-New Hampshire-Vermont* | June 3, 4 and 5 | Rockland, Maine | Samoset |
| California | June 4, 5 and 6 | San Francisco | Sheraton-Palace |
| New York | June 16, 17 and 18 | Schroon Lake | Scaroon Manor |
| Michigan | Sept. 9, 10 and 11 | Grand Rapids | Pantlind |
| Arkansas | Sept. 15 and 16 | Hot Springs | (Unannounced) |
| Rocky Mountain | Sept. 17, 18 and 19 | Salt Lake City | Utah |
| USITA Annual convention | Oct. 13, 14 and 15 | Chicago | Conrad Hilton |
| Virginia | Oct. 30 and 31 | Roanoke | Roanoke |
| Oklahoma | Nov. 5 and 6 | Oklahoma City | Huckins |
| Alaska | Nov. 12 and 13 | Juneau | Baranof |

*Joint Convention

## Pennsylvania Independent Secures $2,350 Increase

Sugar Valley Telephone Co., Loganton, has been authorized by the Pennsylvania Public Utility Commission to effect a $2,350 rate increase, it was reported on Nov. 28.

The company serves 244 subscribers in Greensburg, Loganton and Tylersville. Following are the approved increases:

Residence: one-party, $3.00 to $4.00; two-party, $2.75 to $3.50; four and multi-party, $2.25 to $3.00.

Business: one-party, from $4.00 to $5.00; two-party, $3.50 to $4.50; four and multi-party, $3.00 to $4.00.

# today's Highlights

## of finance-taxes-business trends

*by Willard F. Stanley*

STOCK RALLY DOESN'T HOLD—After scraping the year's bottom in October, stocks nudged up a bit to a point at Nov. 19 (when our last column was released) about 19 per cent below last year's close according to the New York Times average of 50 combined stocks. The forward movement continued at a moderate rate for a while, but just as it looked as if a real rally might be under way, the slip-back tendency reasserted itself and the Times average tobogganed under the October low and stood at December 18, more than 22 per cent below the Dec. 31, 1956 close.

A favorable development for the market in the last month has been the general easing of credit and a sharp rally in the bond market which has served to restore partially the balance between stock and bond yields, thus making stocks more attractive income-wise.

But the market has had to contend with a lot of bad news too: the mild stroke suffered by the President; failure of our "Dudnik" satellite to go up; and, in the business realm, notable weakness in the railroads, both as to prices for their stocks, and their car loadings, the latter for many weeks running substantially below normal levels. On top of all this, the number of unemployed in November topped the figure for that month in any year since 1949.

Many predicters still view the future with optimism, particularly the last half of 1958, but with a number of significant indicators pointing to business let-up, the near-term future hardly looks rosy.

Serious, too, is the fact that business can't afford a let-up because profit margins have been pared to a point where only substantially improved business activity has been maintaining income at an increased level. The danger lies in a slackening of business combined with the narrower profit margins, which might produce considerably lower earnings results. So stock purchases should remain highly selective with emphasis on attractive dividend yields and ability to defend against a moderate recession.

Utility common stock equities continue, we feel, to hold a position of relative attractiveness for new investment or switches from situations with dangerously low profit margins.

*(Please turn to page 40)*

**Mr. Stanley, formerly financial vice president of Southwestern Public Service Co., an electric utility with over 160 million dollars in assets, is president of Corporate Services, Inc. of New York City. He is a member of Controllers Institute of America and New York Society of Security Analysts. He serves on three committees of the Controllers Institute having to do with federal taxation, social security and finance management. His articles are appearing once a month in TELEPHONY.**



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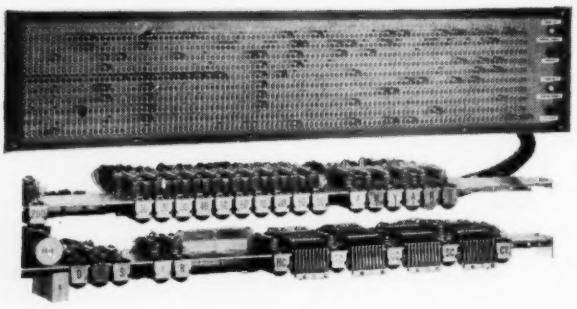
# NOW AVAILABLE at nominal co



Sectional View of Computer Intercept Unit for 100 Line TPL or 1,000 Station TPS Installation.

Advanced technique of printed circuity is used in this equipment. The Magnetic Impulse Counter is the basic unit of the computer register circuits, supported by standard telephone relay apparatus of recognized manufacture.

Congratulations
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Telephone Association a
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Other UNIVERSAL Telephone Equipment:
DIGIT ABSORBER for 2-5 Numbering
Code-to-Selective RINGING CONVERTER

INDEPENDENT

# UNIVERSAL 100% COMPUTER INTERCEPT

DIRECT DISTANCE DIALING
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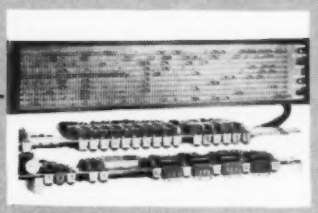

Buy the ultimate requirements in intercept equipment. Not "merely adequate" . . . not 20% . . . not 99% . . . but 100% intercept is the ultimate requirement for direct distance dialing. Universal Computer Intercept offers 100% intercept at nominal cost, compatible with any make switchboard, and easily inserted anywhere in the dialing train. The unit is completely factory wired and may be installed by regular maintenance personnel. Simplicity of design lends to minimum maintenance requirements.

CHECK THESE ADDITIONAL BENEFITS OF UNIVERSAL COMPUTER INTERCEPT

- ✓ Increase Schedule A Commissions.
  Your TPL will have the effective features of TPS intercept *to add to* your toll settlement.
- ✓ Increased Revenue through Increased Trunk Usage Time.
  Reduce the repeated attempts on long-haul toll calls that keep valuable toll switching apparatus tied up.
- ✓ Savings in Time and Material in Adding Intercept Service to your Operation.
- ✓ Intangible Advantages.
  - Immediate intercept of calls to busy lines for non-working or changed numbers on these lines.
  - Intercept of incoming toll calls by request of customer or commercial department.
  - Many others of commercial value.

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MAIL THIS COUPON TO THE NEAREST ADDRESS

Gentlemen: I am interested in your Universal COMPUTER INTERCEPT.

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BOND PRICES SOAR—While the stock market has had to digest an intake of considerable poison in the past month, the bond market has been feeding on nothing but nourishing meat during that period. Right about face in bond prices has been principally due to change in Federal Reserve policy: first in lowering the rediscount rate and, even more important, in resuming so-called "open market" operations in government securities, whereby the reserve, by its purchases, tends to create easier, and therefore, cheaper, credit.

Rates for many forms of short-term funds have reflected decreases for the first time in a year or more. Treasury bill rates, for instance are around 3 per cent compared with about 3.75 per cent not long ago.

The Wall Street Journal tabulation of 17 new public utility funded debt issues shows a reduction in average yields of 28 decimals (.28 per cent per annum), a remarkable performance. This reflects an average increase in price of these new securities of almost 6 points or nearly 6 per cent of offering prices. This percentage increase may not sound impressive, but actually it's extraordinary, considering the high quality of the securities and that they have been outstanding only a short time.

Turning to a comparison of yields on new utility funded debt offerings made shortly before this was released with those made some six weeks earlier, we find Chesapeake & Potomac Telephone debentures offered Dec. 10 on a 3.98 per cent yield basis, compared with a 4.9 per cent yield basis for the AT&T debentures which carried an offering date of Oct. 30. This reflects a drop in interest rate of almost 1 per cent per annum in less than six weeks. Long-term government bonds have joined the procession, registering considerable gains in their market price.

Has a temporary ceiling on bond prices now been reached? Has this phenomenal rally in the bond market reached its temporary limit? The pendulum may have swung too far upward in bond prices in recovering in six weeks such a substantial part of the aggregate rise in interest rates which developed throughout the past 18 months.

However, barring another change in front by Federal Reserve (most unlikely in the near future) and a broad upsurge in demands for long-term credit (likewise improbable if present estimates of reduced expansion outlays in 1958 prove correct), then in seems likely the high-interest plateau has been broken through sharply for some time to come. Near-term developments may adjust the too-violent upward movement in bond prices, but over a six-to-eight-month period, yields should remain well below the ceiling which was scraped by the high yields on offerings in late October.

It is recommended to utilities wishing to sell long-term debt to meet near-term cash requirements that they move as rapidly as possible in an endeavor to take advantage of the prevailing drastically lower yields. Any time that yields on new issues of top grade debt securities decline 20 per cent in six weeks (as they have at this writing), a green light is strongly indicated for all near-term funded debt financing.

Perhaps borrowers can't get to market before a reaction sets in which may carry yields a bit upward again, but to await market conditions better than those prevailing seems most unwise. The rest is a matter of good judgment (and good luck) in timing the offering.

The green light that now shines so brightly for new funded debt financing (and, by analogy, for new offerings of preferred stock, where yields have also improved considerably), still lights the way for common stock offerings. Recent common stock offerings by utilities have gone well at yields and price earnings ratios favorable to the issuers. Here, also, conditions are too good to warrant holding back in the hope of better. Our suggestion of financing common stock equity needs up to a year or more in advance therefore still holds.

The sharp improvement in bond prices and the problems posed thereby seem of such high relative importance that other subjects must presently be deferred for lack of space until next month. At that time we hope to have a few helpful suggestions as to individual federal income taxes.

## IN THE NATION'S CAPITAL

*Concluded from page 19*

area of great promise for the public service.

(9) *Rate Cases during the New Year.* Here is another "repeater" which must be given the same forecast as a year ago. Continued inflation, continued high cost of money, and continued high operating cost are going to keep the state commissions busy throughout most of the year 1958 with telephone rate cases. There will also be further controversy over such fundamentals as cost-versus-value rate base determinations, depreciation practices, and the allowable rate of return. Only in the area of new construction is it possible that there may be some softening in programs before the end of the year.

Furthermore, as prices get more and more out of line with original cost, there will be greater, rather than less, pressure on state commissions to re-examine their basic concepts as to rate base, depreciation, return, etc.

(10) *Regulatory Legislation.* A quiet year is seen on this front. Again this is due to the fact that not many legislatures will be meeting. The only exception in sight would appear to be the controversial New York area. Governor Harriman, of course, will renew his demand for a statutory change in the telephone regulatory law of that state so as to require an original cost rate base.

The prediction is made that he will again fail to get what he wants. The reason is that the New York Public Service Commission has already demonstrated that it can fix rates more or less on an original cost basis without any necessity for a change in the law. The New York Telephone Co. may not be too happy about this as far as rate relief is concerned. But, it is some vindication for the state legislators who blocked the governor's request last June.

### Grant $9,408 Rate Increase To Wisconsin Independent

A $9,408 rate increase was authorized for the Mosinee Telephone Co. on Nov. 29 by the Wisconsin Public Service Commission (TELEPHONY, Aug. 17, p. 30). It was stated that the company is completing conversion to dial service.

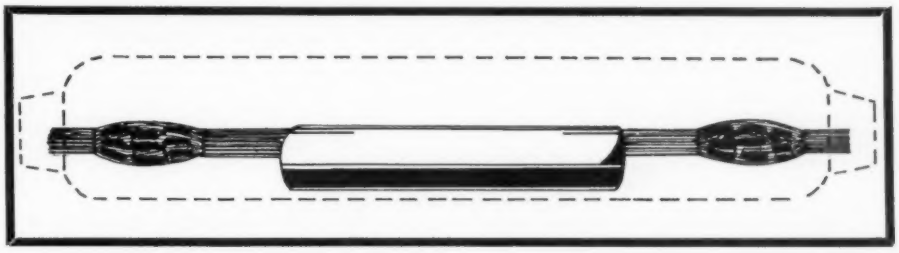
### Chance Named to NAM Board

F. Gano Chance, Centralia, Mo., president of the A. B. Chance Co., has been elected to the board of directors of the National Association of Manufacturers at a meeting in New York, it was reported on Dec. 12.


# CEECO LOADING COILS

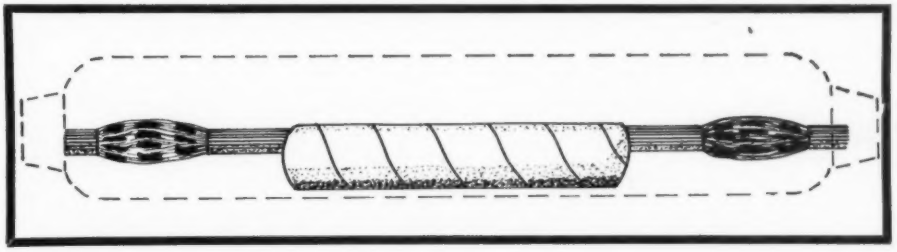
## Units for Splicing Mounting

**These assemblies are supplied on a wooden dowel, sometimes called sleeve mounted for use in the cable splice.**



**TYPE 162 FOR MOUNTING IN PLASTIC CABLE SPLICE**

**Type 162 assemblies can be supplied containing from one to 16 coils of either Type 632(88MH) or Type 638(44MH) and are for use in plastic cable splice. Types MF10, MF11, 641 and 642 coils can be furnished for inter office and toll entrance cables.**



**TYPE 167 FOR MOUNTING IN LEAD CABLE SPLICE**

**Type 167 assemblies can be supplied containing from one to 16 coils of either Type 632(88MH) or Type 638(44MH) coils and are for use in lead cable splice. Types MF10, MF11, 641 and 642 coils can be furnished for inter office and toll entrance cables.**

CEECO assemblies give "Life like" voice transmission and reception to your long cable and rural distribution wire circuits. "Life like" telephone transmission is a clear, easily understandable telephone conversation over the necessary frequencies present in the voice to be heard via the telephone in the same volume as in "face to face" conversation. Telephone companies providing such quality service will increase subscribers desire to use "LONG DISTANCE" more often, thus increasing revenue.

***Write us for assistance on your loading problems. CEECO loading coils are sold by your telephone equipment supplier.***

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- **Wire saves poles**
- **Easy wedding**

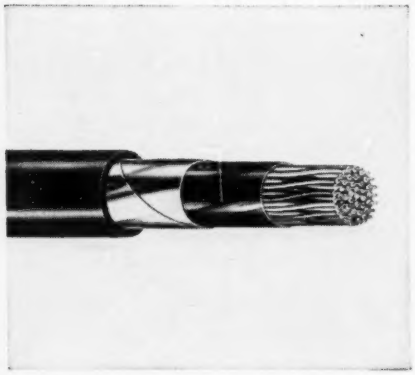
Published regularly to help you get the most out of your materials and supplies dollar

*by Walter G. Baum, Office Mgr. and Inside Sales—Kansas City*

Although I'm from Missouri, nobody has to show me how much careful attention is paid to your supply needs at Stromberg-Carlson. You might be interested to hear why. Well, these orders of yours for parts and equipment, actually help further the science of telephony. We're up to our neck in this industry as a full-time job. We appreciate your support—because your supply business plays a major role in helping us continue our research for new and better telephone equipment—**for you.**

### Gives maximum protection

This cable made by Ansonia Wire & Cable Company offers finer electrical characteristics than any other comparable cable.



Available in 24, 22 and 19 gauge, 11 through 404 pair

To get maximum protection against moisture and weather, specify Ansonia Type 775-P Aerial and Duct Cable.

Its conductors are individually insulated with polyethylene and paired with systematically varying lays to eliminate cross-talk. The cable is shielded with aluminum tape and protected by a tough, plasticized polyvinyl chloride jacket.

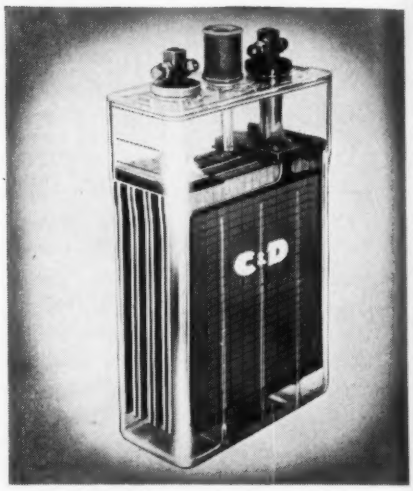
### Noise can be money!

Take a business subscriber who has a telephone in some extremely noisy location—and who has finally decided to do something about it. Would you rather have him spend money in building a soundproofed booth—or give **you** the money as monthly income on a telephone which completely licks the noise problem?

The GAI-PHONE is such an instrument. It has a special transmitter that actually creates a "Zone of Quiet" around the handset—even in a spot as noisy as a boiler factory!

### Battery will live 25 years

A quarter of a century is the expectancy of an extra-life battery made by C & D Batteries, Inc. In full-float service, their PlastiCal (lead calcium grids) battery will serve your power needs faithfully —often well beyond its 25-year expectancy.




It'll be 1982 before you even have to *think* about replacing this extra-life C & D battery, if you install it now!

C & D Batteries' PlastiCell (high tensile, special alloy grids) battery offers reliable power supply at lower cost, with a life expectancy of 14 years.

### Save 10-15 poles per mile

A net saving of 10 to 15 or more pole structures per mile is possible where **Crapo** High-Tensile Telephone Line Wire is used in long-span construction. Fewer pole structures mean substantial savings in time, labor and material, and in maintenance.

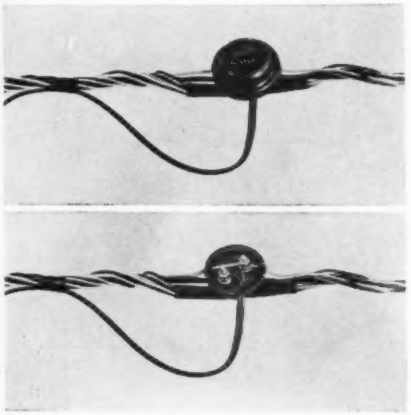
**Crapo HTL-135** makes possible spans of 350 feet in heavy, 450 feet

in medium, and 500 feet in light loading areas. Its practical economy should be considered for new extensions and where old lines are to be replaced.

**Crapo HTL-85** (No. 12 B. W. G.) permits spans of 225 feet in heavy, 325 feet in medium, and 375 feet in light loading districts; provides stronger spans on existing pole structures. Both wires possess superior telephonic transmission qualities.

### Makes Tough Connection Simple

You can greatly simplify the tough unprotected single pair connection between drop or bridle wire, and RD or Urban Distribution wire—with Reliable Wire Terminal No. 5500.



Work-saving wire terminal by Reliable Electric Company

A stainless steel clamp mounts the unit securely on the steel support wire. Neoprene cover snaps securely to make a weather-tight enclosure. The body is rugged molded phenolic, with binding posts and mounting screw molded integrally.

You don't have to cut the RD wire when installing. Simply skin and terminate.

---

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# DESIGN OF SMALL COMPANIES

*Continued from page 23*

out excessive labor costs. It also will result in station outages during the conversion and set up a condition whereby, during the cut-over, part of the exchange will be operating on the magneto basis and part on dial with no connection between them. The plan may be satisfactory in a very small exchange but, nevertheless, it deprives the customer of telephone service which is the only thing we have to sell. It could result in a rental rebate if the length of the outage is beyond that which the customer regards as normal. Public relations will also be affected, regardless of the length of the outage since the customer is paying for service which is not being supplied.

Another plan is to half-tap each drop and open wire lead to both the new and old plant. At cut-over time, the old board will be cut off and the new one placed in operation. Here the old plant, after the cut-over, will be a potential source of trouble until after all drop half-taps have been removed. However, the plan does have merit in those cases where the majority of the drops and station wiring have been replaced and where the placing of a temporary tie cable would be prohibitive because of the cost involved. It would, however, cause considerable station outage because of the time needed to remove the individual drop half-taps and should, therefore, be used only if tie cable costs are excessive.

A fourth plan can be used if all urban stations have been rewired and new drops placed. Here the magneto installations are left intact and the new dial installations connected to the new switchboard. However, all rural lines must be half-tapped or partially jumpered so they can be cut into the new cable with a minimum of effort shortly after the cut-over. As in the first plan, proper testing can be accomplished, but customer participation will be necessary on all rural lines.

The toll facilities of the exchange will also require a cut-over procedure which will coincide with that followed for the exchange lines. The Bell company and any connecting companies should be given sufficient notice of the exchange cut-over plans so that the necessary changes on their equipment can be made in advance of the conversion date. The actual toll cut-over can normally be handled by the two-drop method or by a permanent drop to the new office and using a tie cable pair to the magneto board.

In many instances, the actual cut-over of an exchange is considered to be the major problem in a conversion program, and many conditions are encountered which would be eliminated if an acceptable procedure is followed. In a previous section covering central office equipment (Nov. 30 issue), a plan was suggested which will be reviewed here so that a complete procedure can be set forth. *Fig. 3* (Nov. 30 issue) showed a suggested individual card which can be set up for each subscriber and on which the new dial number (and other data) which has been assigned to each customer can be entered. A suggested cut-over sheet also was shown in *Fig. 4* (Nov. 30 issue). This sheet should be prepared from the information shown on the individual subscriber cards, along with information covering regrouping, regrades and new business.

In any telephone exchange, full utilization of the outside plant cannot be accomplished without a suitable cable record, and the work done in connection with a rebuilding program will supply all the necessary data. This record should show all the cable pairs in all cables in the exchange, together with the various terminals connected to those pairs. In addition to that, all working pairs should show the line numbers which are receiving service over a particular pair. In the case of rural party lines, only the line number is shown, but in all other cases the actual subscribers connected to the line are also shown, together with the terminal where the drop is connected to the cable plant.

The accompanying *Fig. 8* illustrates a suggested cable record sheet covering 51 pairs of a particular cable. The information covering each terminal is secured from the working plans set up in Part 8 and illustrated in *Fig. 5* (Dec. 7 issue). The subscriber data are secured from the cut-over sheets illustrated in Fig. 4 in Part 7 of this series (Nov. 30 issue).

This is a permanent record and, when used with the individual subscriber record cards illustrated in *Fig. 3* (Nov. 30 issue), it will supply information which is necessary for continuous efficient exchange operation.

The cut-over sheets completed to show all subscribers, their addresses, the type of telephone wanted, and the telephone numbers will permit the installers to make the installation in accordance with the cut-over plan previously determined by the company, which, in this case, was to be from magneto to automatic with full selective harmonic ringing. It is further assumed that the conversion will be ac-

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complished by means of a tie cable between the offices and that the customer will cut off the temporary jumper wires between the dial and magneto telephones.

The installer is now ready to visit the first subscriber shown on his cut-over sheet to make an installation with the type of telephone requested by the customer in the same or a new location. Unless the station installation is fairly recent, the drop and interior wire should be replaced. The old instrument will be left in place and connected to the new installation by means of a temporary jumper wire. The magneto ringer can be removed on all single line telephones, since the new straight-line ringer will respond to the magneto ringing current. This will eliminate the necessity of the customer cutting the temporary jumper wires at the time of the cut-over in order to place the line in operation under the dial system, although, if possible it should be done to eliminate a potential trouble source.

In many cases, the location for the old and new instrument will be the same so that the new dial unit should be mounted permanently and the old one hung up or laid in a temporary location nearby. Detailed instructions should then be given to the customer so that he will continue to use the old unit in the same manner as before, and until the date and hour specified for the cut-over. A previous decision on the part of the company will determine whether or not instructions covering the use of the dial telephone should be given at this time, or on a date prior the cut-over when the final testing work is performed.

Incidentally, at this point, the installer and customer are in direct contact so the opportunity is present in each and every installation to make a sales pitch to sell additional service to both residential and business customers.

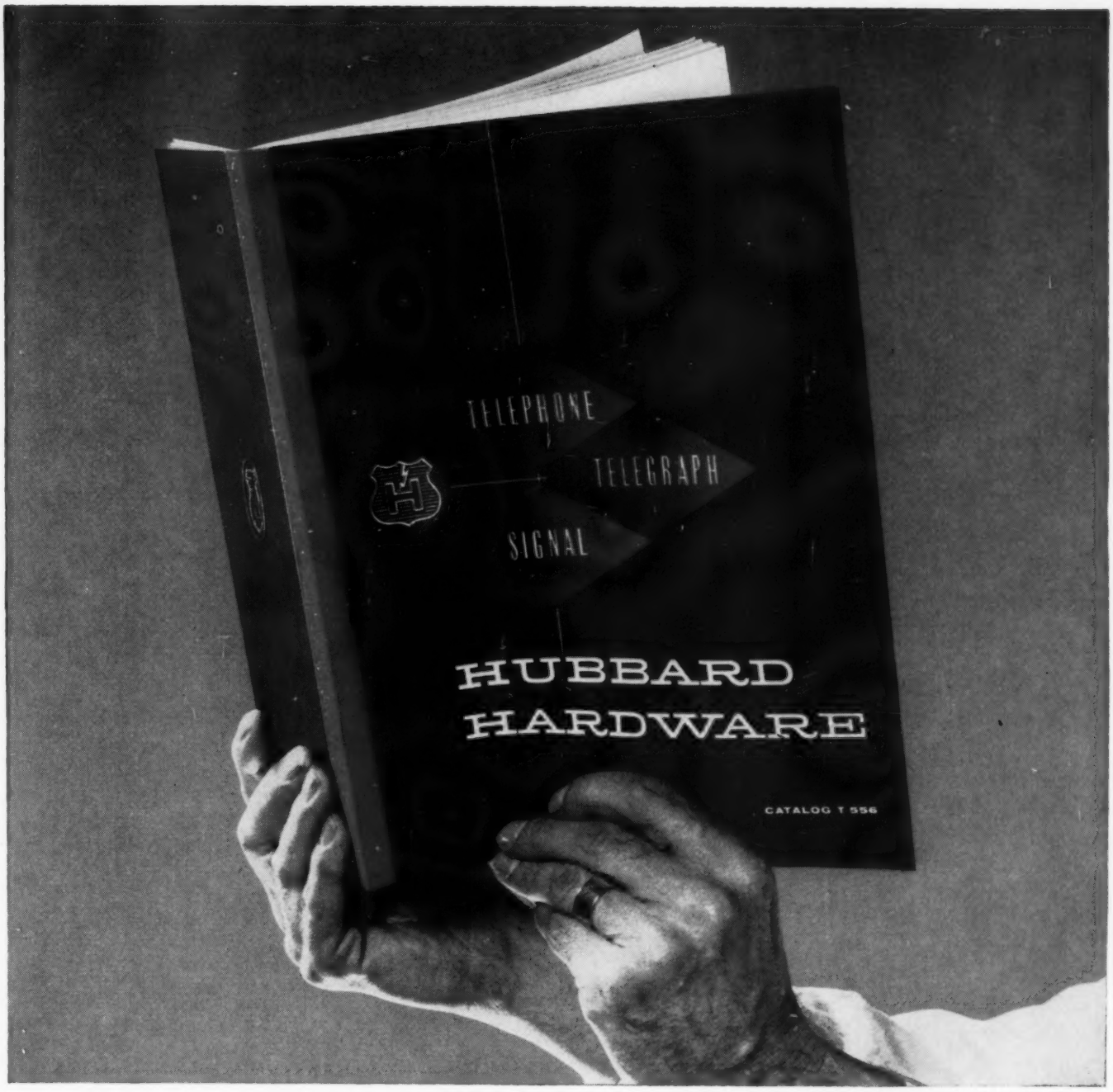
The installer should keep a daily accurate record of all new equipment which he has installed at each customer's premise, along with any rewiring work which was done, all of which should be shown on the individual customer record card. If this information is accurately recorded on a daily basis, it will serve as a permanent record which otherwise cannot be secured without considerable expense.

Dial testing work performed at the completion of each installation will eliminate much of the same work prior to the cut-over date and will also bring out any switchboard trouble which might exist because of faulty installation or inadequate installation testing. Following this plan will result in some station outages, especially on party lines, but some are expected at that time, however, the effect upon public relations will be small compared to that caused by outages that occur after the cut-over date.

The proposed regrouping plan as shown on the cut-over sheets should also be done in connection with the installers' visits. This will result in number changes covering service from the old swtichboard and will cause an additional work load on the operators until the cut-over date. The extent of this load will be in direct proportion to the regrouping work to be done, but it will eliminate many changes which would have to be made after the cut-over at a greater expenditure in labor hours. However, in some cases, the regrouping will have to be deferred, as it will not be possible to do it before the cut-over date since additional plant of a temporary nature would be required to perform the operation.

The completion of all telephone installation work, with the actual testing from the customers' stations, will indicate whether the conversion can be made with a minimum of station outages. There have been cases where cut-overs have been made without the necessary testing but it resulted in station outages of such magnitude that the old system had to be cut back into service until the trouble source could be corrected. If, on the other hand, all tests, including those on the toll facilities to the toll center, indicate that dial operation will function over the new plant, the cut-over can be made on the date and hour which has been set. That time is a crucial moment, since it will bring to light any errors which might have crept into the program and will result in a few tense moments even for those who have had considerable experience in previous numerous conversions. However, with the proper testing completed, all that remains to be done is to energize the dial equipment, remove the main frame insulating strips and, at the same time, cut off the tie cable between the old and new offices, which will place the new installation in operation.

Trouble conditions can be expected from a customer who did not cut the jumper wires to the old magneto telephone, and, of course, if the condition occurs on a party line, all telephones on the line will be entirely out of service. Testing from the office will reveal this condition and a troubleman can be dispatched to remedy it. It is assumed that practically all party line users will cooperate, but should a substantial number fail to do so, the ampere load resulting could be such that it would exceed the capacity of the main fuse, in which case the entire board would be out of service. This con-

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dition can be avoided by rapidly testing each party line before it is converted. This is a recommended procedure, since it cannot be expected that all clocks of the various party line users will be synchronized with time set for the cut-over.

A number of other cases of trouble might appear caused by unforeseen storm conditions, faulty advance testing of central office equipment, and improper use of the dial telephones by customers. Normally, these conditions are of a minor nature and will have very little bearing on the success of the entire conversion.

The remaining work covering the construction for the rebuilding program should now be completed by permanently closing the cable splices at all half-tap locations, after which the removal work covering all displaced plant can be undertaken. Any part of the old plant which might be a potential source of trouble to the new plant should be retired as soon as possible. However, all magneto telephones should be removed as soon after the cut-over as possible, since adverse customer reaction might result if it is not done.

The disposition of all displaced plant, such as junk cable and wire, will depend on market conditions as far as the salvage price is concerned. However, magneto telephones, especially the older wall type units, are fast assuming the status of an antique collector's item and, in many instances, the price received for them is far in excess of that usually secured from regular disposal sources. It is suggested that the old telephones be advertised in telephone trade magazines.

*(To Be Continued)*

## THE PLANT MAN'S NOTEBOOK

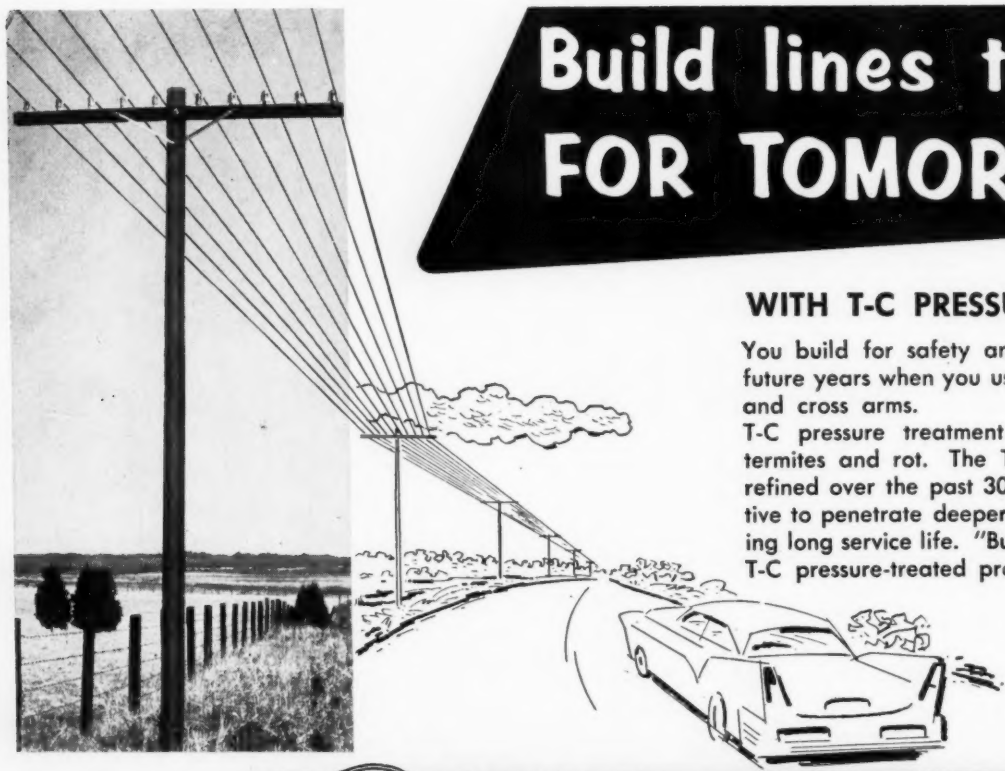
*Continued from page 23*

"A Sealing Connector for Small Insulated Conductors" was presented by the author at the 1956 symposium, and described development progress toward a wide-range sealing connector for small plastic-insulated conductor requiring no removal of wire insulation for use. This paper outlined the research history and conclusions which led to development of a connector which displaces wire insulation by shear, connects mechanically, insulates and seals in one compact unit. This connector was reported to the 1956 symposium as a development in process, but sufficiently near completion to draw some conclusions as to the contribution such a device could make toward the moisture-proof splicing of plastic-insulated telephone cable. The purpose of this year's paper was to report on the results of field study of the shear-type, sealing connector conducted during 1957.

Both the advantages and limitations of the shear-type, sealing connector, Model 1957, used in these studies have been summarized and analyzed. The goal of 99.99 per cent reliability was reached to within .08 per cent and proved attainable. Modification of the connector to eliminate imperfection of the 1957 field study model has been initiated and is nearing completion.

Final verification of these modifications will require further field observation in addition to the laboratory evidence accumulated at the date of this paper. It is expected that commercial form of the connector utilizing the improvements made possible by field studies will appear in 1958.

The many interesting papers presented at this year's symposium indicates clearly that considerable effort and expense are being contributed toward the development of a less costly

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## AT&T Issues 1956 "The World's Telephones"

Alaskans have displaced Hawaiians as the talkingest people on the globe—as far as the telephone is concerned.

Alaska averaged 630 conversations per person last year to lead the talking list, according to "The World's Telephones," an annual survey released recently by the American Telephone & Telegraph Co.

Hawaii, which had been first the year before, came second this time with an average of 531 conversations per inhabitant. Canada reported 481; Sweden 455; and the United States 426. The world average was 51.

The new edition of the telephone facts-and-figures also shows:

(1) Throughout the world more telephones were added during 1956 than ever before. The gain of 7½ million telephones brought the total number in use at the start of 1957 to 110 million.

(2) New York had more telephones than any other city. Only three countries (the United Kingdom, Canada and West Germany), other than the U. S., had more than New York's 4,077,000.

(3) The U. S. had 35 telephones per 100 persons. Sweden ranked second

**In publishing the article entitled "Modern Trends in Design of Carrier Telephone Equipment," by B. R. Stachiewicz (above) in the Dec. 7 issue of TELEPHONY, we inadvertently errored in listing the affiliation of the author. Mr. Stachiewicz is Senior Member of Technical Staff, Federal Telecommunication Laboratories, a division of International Telephone & Telegraph Corp., located in Palo Alto, Cal.**

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with 32. The world in general had four per 100 population.

(4) Washington, D. C., with 65 telephones for every 100 persons was first among all cities in telephone density. Stockholm outranked other foreign cities with 56.

The 1957 edition of "The World's Telephones" also contains data on Hungary and Poland—the first telephone statistics to come out of these countries since 1948.

All of the information in the booklet relates to the beginning of 1957. It takes nearly a year to gather statistics from the more than 200 countries.

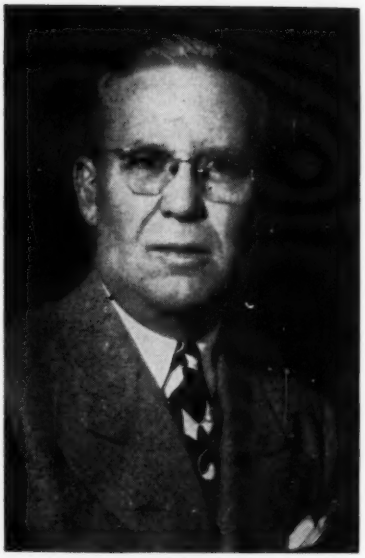
## Ray Dalton Retires From West Coast Company

Ray Dalton, vice president and general manager of the West Coast Telephone Co., Everett, Wash., since 1942, has announced his retirement from active service effective Jan. 1.

Associated with the West Coast company and its predecessor companies for almost 33 years, Mr. Dalton has achieved a notable record for distinguished industry and community service. During this period the West Coast Telephone Co. grew from a small and local enterprise serving some 17,000 company telephones to become the nation's ninth largest Independent telephone company with over 150,000 telephones in 1957. Within the past 12 years alone the company has increased its investment in telephone plant from 7½ million dollars in 1946 to over 50 million dollars at the end of 1957.

After attending the University of Washington, Mr. Dalton spent 20 months in the military service, including combat duty with the AEF in France and Belgium during World War I. On his return from military service, he joined the Washington State Department of Public Works until 1925, when he accepted employment as commercial representative for the Puget Sound Telephone Co. in Everett, Wash. The Puget Sound company later became the West Coast Telephone Co., and Mr. Dalton was successively named Everett district commercial superintendent in 1928, Everett district manager in 1930, and then vice president and general manager in 1942.

For many years, Mr. Dalton has been nationally prominent in telephone industry circles. He is a past president and current member of the board of directors of the United States Independent Telephone Association. He has been very active in USITA committee work and presently is a member of the executive committee and chairman of the personnel committee. He is a past president and current member of the



RAY DALTON

board of directors of the Washington Independent Telephone Association. He is past president of the Independent Telephone Pioneer Association. After World War II, he was a member of the Telephone Industry Advisory Committee of the War Production Board for several years.

In Everett and Snohomish County he has served as president and member of the board of directors of the Everett Chamber of Commerce, Everett Rotary Club, and the YMCA. He was active in organizing the first Everett Community Chest and later served as president. In recent years, he was campaign chairman for the Snohomish County United Good Neighbors. He was a member of the board of directors of the Everett area council of the Boy Scouts of America and one of Everett's first citizens to receive scouting's highest area recognition, the Silver Beaver Award. He has also served as vice chairman of the Snohomish and Island County Chapter of the Red Cross.

"The growth and progress of the West Coast Telephone Company has given me a great sense of satisfaction," said Mr. Dalton. "I have every confidence that the company will continue to grow with our great Pacific Northwest."

Although retiring from active service at this time, Mr. Dalton will continue his association with the company in a consulting capacity.

## March of Dimes Goes On

To those polio victims for whom the Salk vaccine came too late, mere survival is not enough. Please give to the 1958 March of Dimes, Jan. 2 through 31.

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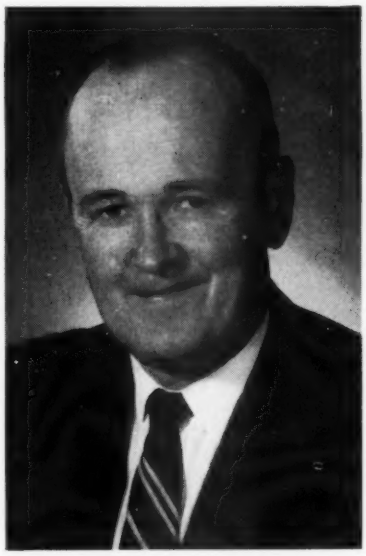
## T. R. Warner Named USITA Radio Engineer

Thomas R. Warner has been appointed radio engineer by the United States Independent Telephone Association, according to an announcement by Clyde S. Bailey, executive vice president of the association. Mr. Warner will take up his duties on Jan. 1.

Mr. Warner goes to the USITA from National Bus Communications, Inc., of



T. R. WARNER

Chicago, Ill., of which he was vice president and general manager. He has had a wide experience in all phases of the radio field.

In 1935, following graduation from Michigan State College, Mr. Warner joined the Michigan State Police Department as radio engineer and he was assigned to work on the preliminary plans for the two-way FM radio system for that state. He remained with the Michigan police until 1940 when he entered military service.

Mr. Warner entered military service as a second lieutenant in the cavalry, a commission which he gained in the Michigan College ROTC.

He was promoted to lieutenant colonel in the cavalry and was appointed to The Cavalry School as chief of the department of communications, where he served until 1945. In 1947, Mr. Warner was transferred to the Signal Corps Reserve. During the Korean War (1951-1952) he served as plans officer of the Signal Corps Training Center and executive officer of the Signal Corps Replacement Training Center at Fort Gordon, Ga.

In 1953, Mr. Warner was promoted to colonel in the Signal Corps Reserve. In his last reserve assignment, 1955-1956, he served as signal officer of the 322nd Logistical Command.

Following completion of his active military career, Mr. Warner joined The Greyhound Corp. as radio engineer. In 1953, he was named director of the company's communications department, in which position he was responsible for the preliminary planning, procurement, installation and supervision of maintenance of the company's 400-mobile-radio unit and 33 land station FM radio system. He also drafted plans and the circuitry of approximately 10,000 miles of leased wire private teletype network for Greyhound.

From 1948 to the present time, while still being associated with the Greyhound company, he was named vice president and general manager of National Bus Communications, Inc.

Since 1945, Mr. Warner has taken an active part in every FCC radio frequency allocation hearing for the bus industry.

Mr. Warner is a member of the Institute of Radio Engineers, Reserve Officers Association and National Defense Transportation Association.

## Radio and Electronics Show To Be Held in Texas

The St. Anthony Hotel and the Municipal Auditorium in San Antonio will be the scene of the 1958 Southwestern Institute of Radio Engineers Conference and Electronic Show. It is anticipated that 2,000 engineers and scientists will attend the three-day event.

Ten technical sessions will be conducted plus a student paper contest. The current interest in the International Geophysical Year will be the conference theme.

Outstanding speakers will present papers on a wide range of subjects of interest to IRE members. Proceedings of this conference will be published for the first time in the 10-year history of the SWIRECO.

There will be 125 exhibit booths for leading electronic equipment and component manufacturers to show their latest products. The dates are Apr. 10, 11, and 12, 1958.

## Southwestern States To Issue Preferred

Approval has been granted The Southwestern States Telephone Co. of Brownwood, Tex., by the Securities Exchange Commission to issue 4 million dollars in cumulative convertible preferred stock, D. T. Strickland, vice president and general manager, announced.

He said 160,000 shares of $1.44 convertible preferred stock at $25 par value per share will be sold at public offerings.

Proceeds from the stock issue will be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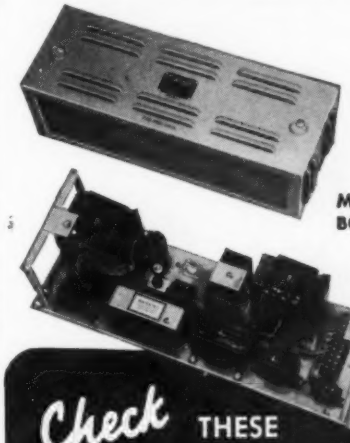

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used to finance expansion and improvement programs for 1957-1958 throughout the company's four-state operations. The company's construction budget for 1957-1958 exceeds 13 million dollars.

## Bell Installs Millionth Telephone in Florida

Claude J. Yates, vice president and general manager of Southern Bell Telephone & Telegraph Co., presiding at installation ceremonies in Miami, recently announced the installation of the one-millionth Southern Bell telephone in Florida. Airtronics International Corp. of Miami, represented by its president, Robert G. Kramer, received the historic installation, which was placed in service in the new electronic firm's recently completed manufacturing plant. This installation placed Florida first among Southeastern states to reach the millionth Bell telephone milestone.

Alan Boyd, chairman of the Florida Railroad and Public Utilities Commission, at installation ceremonies, placed the first call from the millionth telephone to Sen. W. A. Shands, president of the Florida senate.

Mr. Yates, commenting on his company's growth said:

"In 1946, there were 236,311 Southern Bell telephones in service in Florida and our annual payroll totaled $12,658,561. Today after 11 years of growth, more than 13,000 employes are meeting the telephone needs of the communities where they work and live. Our present annual payroll having grown by 300 per cent will exceed 49 million dollars in 1957.

"This telephone growth and expansion has required the investment of huge sums of money in plant, tools and equipment. We have increased our investment in telephone plant over 400 per cent, from $68,337,000 in 1946, to a total of $367,059,000 today.

"Our investment this year of 71 million dollars exceeds our entire investment in the state of Florida in 1946, when $68,337,000 was invested in telephone plant and equipment. With the continuing demand for telephone service, additional investments are necessary. During 1957-58 we plan to spend 151 milliion dollars to meet this demand.

"Florida's vast telephone growth is a direct result of the expansion of business and industry in the state and the continuing influx of new industry. The growth of Florida is a vivid example of how aggressive leadership can contribute to the over-all development and expansion of a state."

## Lincoln T&T Names Walker Plant Superintendent

The appointment of Max C. Walker as general plant superintendent of The Lincoln (Neb.) Telephone & Telegraph Co., effective Nov. 20, has been announced by Thomas C. Woods, company president. He succeeds the late George P. Barney who died on Nov. 14.

M. C. WALKER

Mr. Walker began his telephone career in Lincoln as an apprentice switchman in 1926 and moved to Hastings in 1929 as a switchboardman. He became wire chief there in 1939 and in 1948 returned to Lincoln as district wire chief. Later that year he was named district plant manager of the central district and became eastern district manager in 1952. He was appointed assistant to the general plant superintendent in 1954.

Mr. Walker is a past president of the Frank H. Woods chapter of the Independent Telephone Pioneer Association.

## Johns-Manville Elects A. R. Fisher Chairman

Adrian R. Fisher has become chief executive officer of Johns-Manville Corp. in a realignment of executive responsibilities following retirement of Leslie M. Cassidy, chairman.

In accepting Mr. Cassidy's decision to retire because of ill health, the board of directors elected Mr. Fisher chairman of the board. He also continues as president and director of Johns-Manville Corp., offices which he has held since 1951.

Mr. Cassidy continues as a Johns-Manville director and will be available to the management as a consultant.

The J-M board of directors also created the new office of executive vice president.

Clinton B. Burnett was elected executive vice president and was made a director of Johns-Manville Corporation. Mr. Burnett was designated as "principal assistant in the administration of the company."

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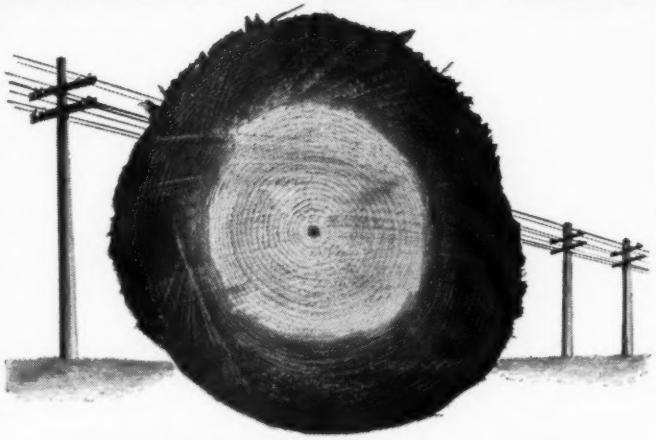

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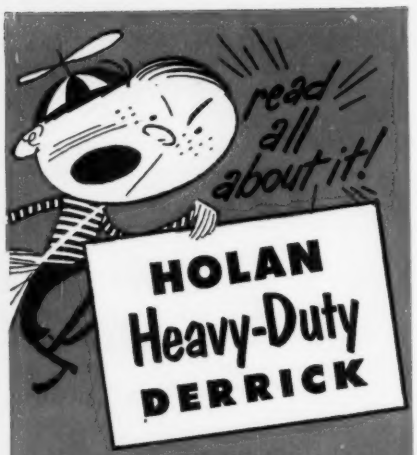


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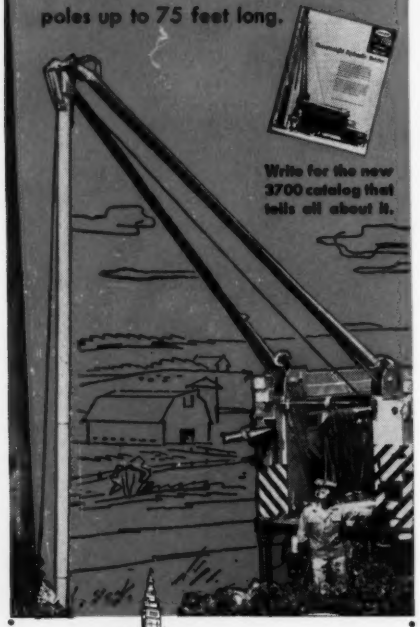

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OTHER PLANTS: GRIFFIN, GA.; PHOENIX, ARIZONA; BRANTFORD, ONTARIO

To: J. H. Holan Corporation
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Please send me the factual technical bulletin about Holan's 3700 Power Derrick.

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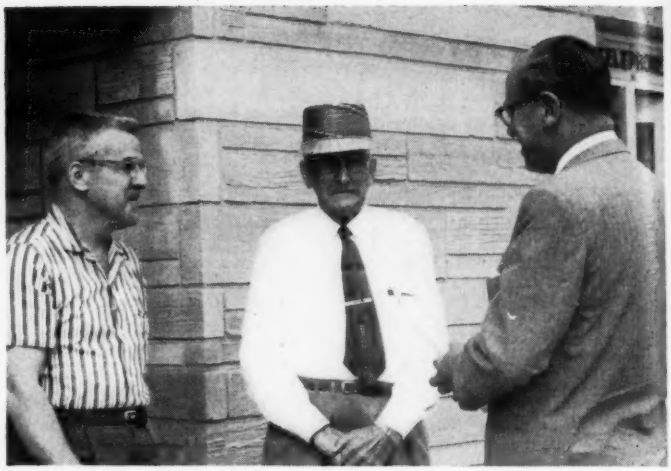


**Russell Logue (left), vice president, and O. A. Logue, president and founder of C. T. & N. Telephone Co., discuss their preference for underground cables with Kenneth C. Gillette, telephone cable specialist for Ansonia Wire & Cable Co.**

## Underground Cable Economical for Illinois Co.

Maintenance costs on buried underground cables are about one-tenth the costs of maintenance on aerial cable in the experience of the C. T. & N. Telephone Co. of Casey, Ill., according to Vice President Russell Logue. Of the plastic cable employed in the company's construction, Mr. Logue states: "It is easy for the cable men to install and gives trouble-free service. Terminals can be connected with a minimum of effort and splicing is much easier. Several of our linemen are very capable splicers, using the hot-air-jet method."

During a thorough-going construction program completed in 1957, 300,000 feet of buried and undreground cable was installed by the company, with some 8,000 to 10,000 feet of aerial cable left in place.

O. A. Logue, president of the C. T. & N. company, states the decision to bury most of the cable in the new construction program was determined by the company's past experience with aerial and buried cables. Casey, served almost entirely by buried and underground cables, has required much less maintenance over a period of 30 years than was required for aerial cables used in other exchanges. Ninety per cent of the 300,000 feet of buried and underground cable now in place is Ankoseal plastic cable, supplied by the Ansonia Wire & Cable Co., of Ashton, R. I.

According to Mr. Logue, during these 30 years of operation, the company experienced many types and quantities of troubles with aerial cables which have never occurred with the buried cables; such as fires, tornadoes, sleet storms, bullet holes, cable ring cuts, power wire contacts and many others.

"The tornado which hit central Illinois this last summer made us thankful for having our cables underground. Whole trees and large limbs were everywhere—there were some 400 drop wires broken, yet not a single cable was damaged," Mr. Logue stated.

"In my forty-five years in the telephone business," continues Mr. Logue, "I believe the use of plastics for cables has been one of the biggest steps toward minimizing cable troubles and has made cable installation much easier."

## Geigy Chemicals Appoints Miles to Industrial Sales

Geigy Agricultural Chemicals, division of Geigy Chemical Corp., announces the appointment of Leo Miles as Simazin industrial sales specialist.

Mr. Miles will devote his efforts to sales development and technical services for Geigy's new pre-emergence, long residual herbicide, Simazin 50W. The company reports this new herbicide, which features many advantages and safety aspects, has stimulated interest in such fields as telephone, petroleum, railroads, lumber, highways, and other industries and utilities where weed control is a problem.

**LEO MILES**

Mr. Miles is a native of Cleveland,

O., and a graduate of Ohio State University, where he received both his B.S. and M.S. degrees.

He joins Geigy with a background in research and sales and, prior to joining Geigy, worked for the U. S. Borax & Chemical Corp. as a field representative in the New York-New England area. Mr. Miles will make his headquarters at the Geigy main office in Ardsley, N. Y.

## Universal Controls Names K. J. Paul Sales Engineer

The appointment of K. J. Paul as sales engineer in the telephone division of Universal Controls Corp., Carrollton, Tex., has been announced by Donald O'Neil, company president.

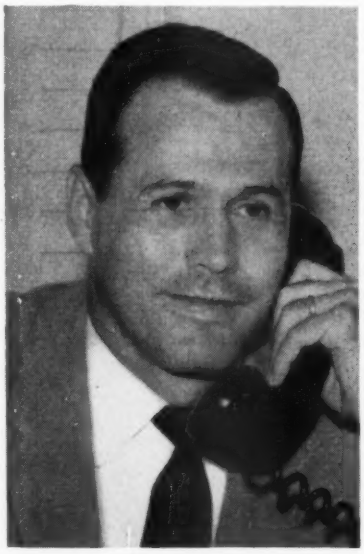
Mr. Paul will handle sales and application engineering for Universal Controls Corp.'s Independent industry customers, and will consult with and assist the engineers of other manufacturers of telephone equipment who represent the Universal company. He will have headquarters in Carrollton.

Mr. Paul started his career in telephony with Western Electric Co. at Detroit, Mich., in 1923. He became associated with North Electric Co. in 1935 and traveled most of the states, headquartering at Galion, O. He moved to Dallas in 1950 as southwest regional manager, covering the states of Texas, Oklahoma, Arkansas, Louisiana, New Mexico, and Arizona, for North Electric.

K. J. PAUL

## Price of Accomplishment

"They that stand high have many blasts to shake them."—SHAKESPEARE.



D. C. Gibson, president of Leich Sales Corp., has announced the opening of a new warehouse and sales office in Tampa, Fla. (see cut). It represents the fourth supply warehouse now operated by Leich. A fifth such source will be opened soon in the East. Gene Martin (left) is manager of the Tampa office, which is located at 5126 S. Lois St., Tampa 11, Fla.

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To J. H. Holan Corporation
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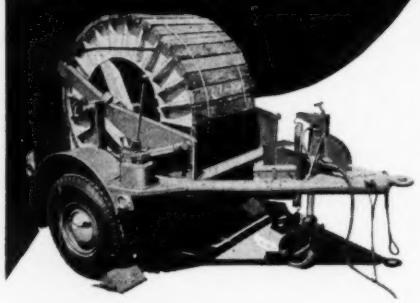

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## Red Cross Cites Bell for First Aid Training

An American Red Cross certificate of "grateful appreciation" for outstanding cooperation in first aid training was presented to the American Telephone & Telegraph Co. and companies of the Bell System on Dec. 4, by General Alfred M. Gruenther, Red Cross president.

Frederick R. Kappel, president of the American Telephone & Telegraph Co., received the certificate from General Gruenther at the parent company office, 195 Broadway, in a brief ceremony marking 45 years of continuous cooperation on the part of the Bell System telephone companies "in disseminating first aid training and providing leadership for Red Cross activities throughout the country."

In describing the participation of the telephone companies as an outstanding example of industrial assistance in advancing the Red Cross program, General Gruenther stated that since 1912, Bell System supervising instructors had been "an important segment of the Red Cross volunteer instructor-trainer group."

It was pointed out by company officials that the Bell System now was approximately 168,000 employes with "active" Red Cross first aid cards and over 6,000 trained Red Cross first aid instructors.

Explaining that a working agreement has existed between the two organizations since the early 1920's, General Gruenther announced that a new agreement will shortly be drawn up to become effective Jan. 1, 1958, to bring the first aid and safety training of Bell System employes in line with the new revised first aid textbook issued this Fall.

A first step is a series of orientation classes for Bell System companies' plant safety supervisors and supervising instructors taught by Red Cross representatives. Classes for eastern and New England companies commenced in Boston during November. Others for mid-western companies have also started at St. Louis, Mo. For other regions of the system classes will commence at Atlanta, Ga., and San Francisco in December.

General Gruenther emphasized that Bell System personnel have assisted in Red Cross activities other than in the first aid program. "Many Red Cross chapters have benefited by their leadership as chapter chairmen and chapter officers, and both the companies and their personnel have been substantial donors in Red Cross fund raising efforts," he said.

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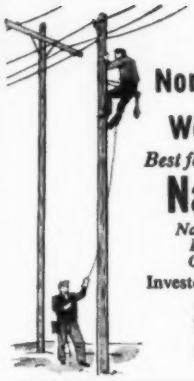

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Recond. W.E. 1011 type Linemen's Rubber Dial Test Handset. $27.50.
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New W.E. #98A station protectors. $1.25.
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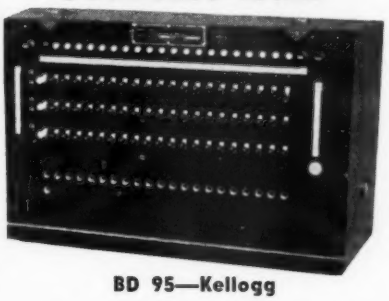

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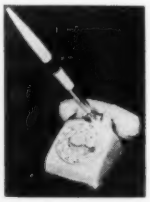

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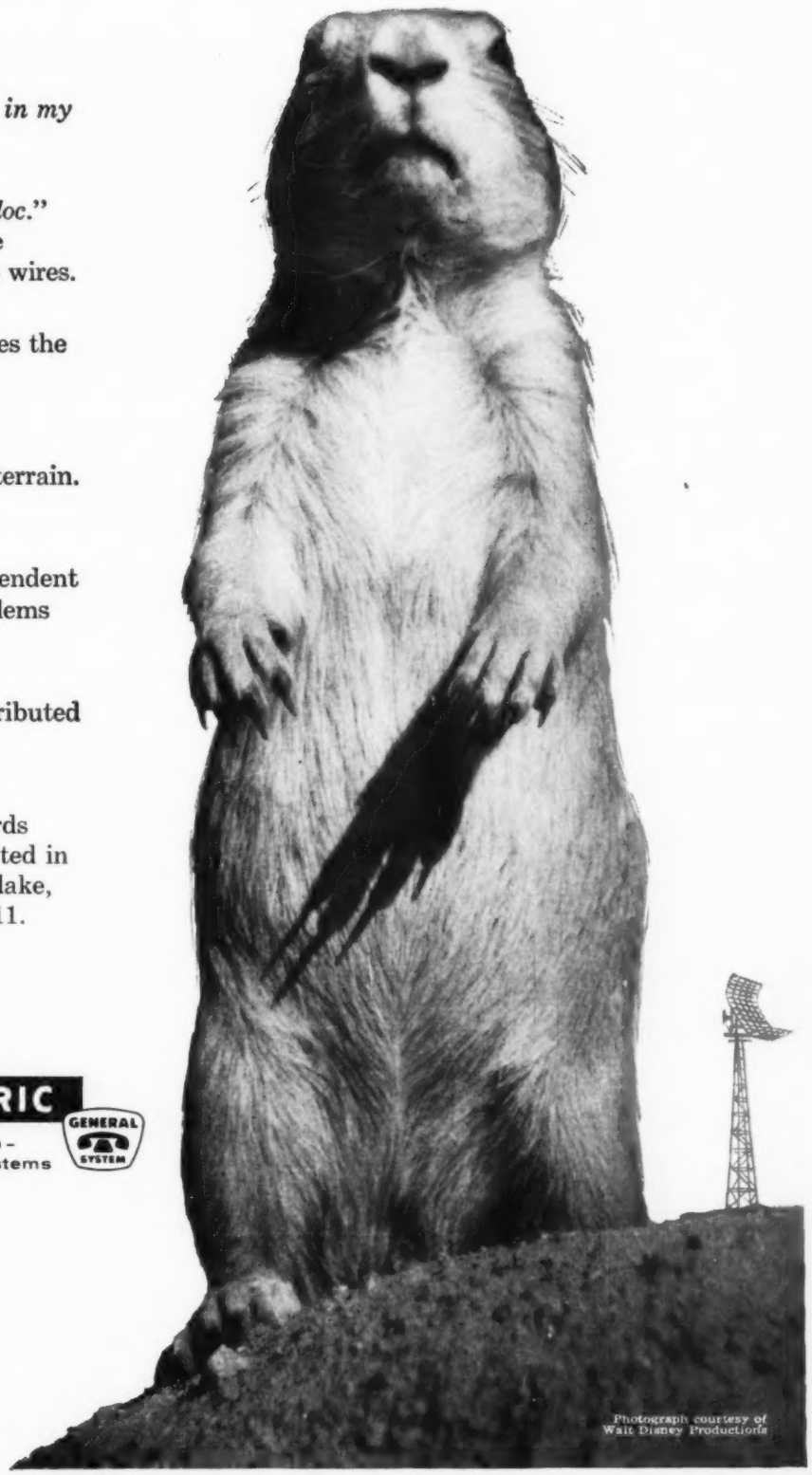

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